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THE

VOYAGE OF H.M.S. CHALLENGER.

ZOOLOGY—VOL. XXIX.

TEXT—SECOND HALF.

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REPORT

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PACIFIC OCEANIC FISHERY
INVESTIGATIONS

ON THE

SCIENTIFIC RESULTS

OF THE

VOYAGE OF H.M.S. CHALLENGER

DURING THE YEARS 1873-76

UNDER THE COMMAND OF

CAPTAIN GEORGE S. NARES, R.N., F.R.S.

AND THE LATE

CAPTAIN FRANK TOURLE THOMSON, R.N.

PREPARED UNDER THE SUPERINTENDENCE OF

THE LATE

Sir C. WYVILLE THOMSON, Knt., F.R.S., &c.

REGIUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF EDINBURGH
DIRECTOR OF THE CIVILIAN SCIENTIFIC STAFF ON BOARD

AND NOW OF

JOHN MURRAY, LL.D., Ph.D., &c.

ONE OF THE NATURALISTS OF THE EXPEDITION

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By Rev. Thomas R. R. Stebbing, M.A.

SECOND HALF.

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EDITORIAL NOTE.

The collections of Amphipoda procured in the trawls, dredges, and tow-nets during the voyage of H.M.S. Challenger were placed in the hands of the Rev. Thomas R. R. Stebbing for examination and description in the summer of 1882. From not long after that date up to the present time Mr. Stebbing has been almost exclusively occupied in the work connected with the preparation of this extensive and valuable Report, which will be welcomed by all students of the Crustacea.

There is the same uncertainty connected with the Amphipoda as with several other groups of animals taken in the trawls and tow-nets, as to the depths at which the specimens were captured. Some were undoubtedly taken at or near the bottom, while others were as certainly taken in the surface and subsurface waters, but with others again there is a great deal of doubt. Although a record of the depths to which the nets were let down was attached to the specimens, the naturalists of the Expedition did not intend to convey the impression that the specimens necessarily came from the depths indicated.

This Report, which forms Part LXVII. and Volume XXIX. of the Zoological Series of Reports, consists of 1774 pages of letterpress, with 212 Plates and a Map. The whole is bound up in three separate portions, two of letterpress and one of Plates.

The first Instalment of the Manuscript was received by me on the 5th December 1885, and the last on the 30th November 1888.

John Murray.

Challenger Office, 32 Queen Street,
Edinburgh, *December* 5, 1888.

Eyes small, oval, situated near the lateral lobes of the head.

Upper Antennæ.—First joint of the peduncle much thicker, but not much longer than the second, twice as long as broad; third joint scarcely more than half the length of the second; flagellum of forty-four or more joints, of which the first is longest, the first six carry short cylinders, and of the rest each alternate joint; the joints of the peduncle have a few short cilia or setules, and have their distal margins more or less lobed; the third has also on the inner side a minute representative of a secondary flagellum, rounded, armed with a single cilium.

Lower Antennæ thinner and much shorter than the upper. Peduncle shorter than the peduncle of the upper antennæ. The first joint not greatly expanded, the second produced on one side all along the third, which it partially clasps, the opening of the (not conical) gland-cone being on the inside at the distal angle of the clasping part; the third joint short, its distal margin irregular, armed with small spines that show each an accessory thread; the fourth joint equal in length to the preceding three united, with groups of spines on its surface and at the apex; the fifth joint a little longer than the fourth, with groups of spines or short setæ on the surface and at the apex; the flagellum of twenty-four joints, of which the first is the longest; these joints are distally furnished with groups of setules.

Upper Lip having the outer plate apically divided by a small oblique emargination into two unequal lobes.

Mandibles.—The cutting plate rather small, its edge divided into six or seven consecutive teeth; the secondary plate on the left mandible nearly as large as the principal, divided similarly into six teeth; this plate on the right mandible is slighter, divided into two teeth, one of which, having the appearance of being broken or much worn, is approached by the serrate outer edge of the plate; the spine row of thirteen slender, backward curving, spinuliferous spines, the row filling up the small space between the cutting plates and the prominent molar tubercle; crown of the molar tubercle oval, dentate, and ciliated; the articulating process blunt, close to the base of the palp which is just over the molar tubercle; the first joint of the palp carrying one or two spines, the second joint having several along the front margin and surface adjoining it, its hind margin a little concave; the third joint subequal in length to the first and second united, its outer border convex, its outer surface covered with adpressed cilia, its inner margin for almost the whole extent fringed with pectinate spines, of which there are on the apex two very long followed by two shorter.

Lower Lip.—The principal lobes very broad and thick, much ciliated apically; the mandibular processes very short.

First Maxillæ.—Inner plate squarish oval, with four plumose setæ on the apex, alternately long and short; the outer plate much broader than the inner, with ten spines on the truncate distal margin, the one row slender and denticulate, the

other rather shorter and stouter, and with a single lateral denticle or none; the palp, which is densely ciliated on the surface, has on the distal border of the long and much curved second joint seven or eight spine-teeth, that at the outer angle longer than the rest; there are also setæ on the surface near the distal margin.

Second Maxillæ.—Both plates a little curved, much ciliated, with spines round the apical margins, and descending a little way down the inner margins, at the distal part of which the shorter inner plate has two large plumose setæ.

Maxillipeds.—The inner plates, which do not reach to the middle of the first joint of the palp, on the inner margins have several plumose setæ, which pass over towards, but not to, the outer apex; the distal margin sloping outwards, carries on the truncate inner angle three small teeth set close together, the central the longest, beyond which the margin has two short and two longer incurving plumose spines; the outer plates reach just beyond the first joint of the palp; the inner margins smooth, except for a microscopic crenulation, at the apex forming an angle, behind which the distal margin rises a little, and is set with a close row of six short curved spines; there are a few setiform spines on the outer surface at some little distance from the inner margin; both the inner and outer plates are strongly ciliated; the first joint of the palp is as long as the second, its inner margin not so long as the outer, but longer than usual and fringed with spines as in the two following joints; the second joint a little longer than the third; the third equal in length to the sharply pointed finger; the spines on the palp are spined on two edges, coarsely at the centre, finely towards the apex; the finger has a couple of cilia at the base of the sharp slender nail.

First Gnathopods.—Side-plates bent forwards to a rounded point, front border concave, hinder and lower continuous, to a certain extent serrate; some spines on the upper part of the hinder margin and on the inner surface; the first joint widening distally, with groups of spines at the apex and on the surfaces, chiefly on the inner surface near the concave front margin; the second joint short; the third oblong, with groups of pectinate spines on the serrate hind margin, and along and near the distal margin; the wrist triangular, distally broad and cup-like, the length and breadth nearly equal, armed like the preceding joint; the hand irregularly oval, longer than the two preceding joints united, as broad as the wrist, the front margin smooth and little curved, the hind margin at first smooth, then crenulate, and finally showing two broad emarginations, the inner surface carrying numerous groups of spines, the outer a few; the palm not specially defined; the finger closing down not quite to the end of the indentured part of the hind margin, which is set with groups of slender spines, stout spines and setules, of the groups including the stout spines with accessory threads there being two on the outer and four on the inner side, between which the apical part of the finger closes.

Second Gnathopods.—The side-plates similar to the preceding, but longer and less

bent; the limb also similar, but in all parts larger, the chief difference of shape being in the hand, which has a well-defined palm, the border of which turns at first almost at right angles to the spine-beset hind margin, then forming a great cavity by its junction with a large triangular process which projects just below the hinge of the finger; over the end of the triangular process and the outer part of the cavity the broad finger bends, resting its tip among spines on the inner surface above the commencement of the palm; some strong spines are set near the commencement of the palm, while the cavity and the process above mentioned are fringed with setules.

First Peræopods.—Side-plates longer and less pointed than in the preceding pair The limb similar to the following pair.

Second Peræopods.—The side-plates longer than in the preceding pair; the surface vertically ridged or raised in this as in the two preceding pairs; the front margin straight, the hinder excavate just at the top, then sloping forwards to the narrow lower margin. The branchial vesicles broadly oval, shorter than the first joint of the limb. The first joint not reaching the end of the side-plate, its front margin fringed with setiform spines of various lengths; the second joint comparatively long; the third much longer than the fourth, with spines at two points of the hind margin and at the apex, which has a little lobe, spines at two or three points of the front margin and at its long, acute, decurrent apex. The fourth joint like the third widening distally, shorter than the fifth, with three groups of spines on the serrate hind margin and a large group round its apex, the front margin free, its apex pointed; the fifth joint shorter than the third, somewhat curved, almost parallel-sided, with spines at five points of the hind margin, some spinules on the front; the finger curved, considerably shorter than the fifth joint; dorsal cilium short, near the hinge; two or three more cilia on the hind margin and at the base of the nail.

Third Peræopods.—The side-plates broader than the preceding pair, strongly bilobed, the hind lobe narrower, but considerably deeper than the front one, distally pointed. The branchial vesicles much as in the preceding pair; the whole series is very uniform in shape, graduated in size, so that the central pairs are the largest; none are very large, all inflated, and more persistent than usual; whether the last peræopods had any I did not perceive. First joint of the limb oblong, broader below than above, the lower hinder lobe overlapping the second joint; the front margin with spines at a few points, the hind margin almost smooth, sinuous, but all the central part concave; the upper surface is longitudinally ridged; the second joint has spines at two points in front; the remaining joints are like those of the preceding peræopods in shape and armature, but are thicker and stronger, the fifth and sixth joints also a little longer; the third has spines at five points in front, the fifth at six points, and the finger six cilia on the outer margin.

Fourth Peræopods.—The side-plates with an inconspicuous lobe in front, the hind

lobe similar to that of the preceding pair, but smaller. The limb closely resembling that of the third peræopods; the front margin of the first joint more strongly spined; that of the third joint with spines at four points only, this margin being shorter than in the preceding pair.

Fifth Peræopods.—The side-plates small. The first joint and the third larger than in the preceding pairs; the limb in general similar.

Pleopods.—The coupling spines small and slender, apparently with three small hooks near the apex, and two long ones on the side lower down; the cleft spines on the first joint of the inner ramus numbering eight in the first pair, the margin above them strongly ciliated, the outer arm of the cleft much longer than the inner; the joints of the rami numbering from twenty to twenty-three.

Uropods.—Peduncles of the first pair a little longer than the rami; the outer ramus rather shorter than the inner; peduncles of the second pair longer than the outer, but rather shorter than the inner, ramus; peduncles of the third pair scarcely so long as the short outer ramus, much shorter than the inner; the rami less broad than in the two other pairs; many small spines on the edges of all the rami, and of the peduncles of the first two pairs, which have also spines at the apices of the rami; the peduncles of these two pairs reach equally far back, the inner ramus of the second as far as the outer of the first, or a little further; the peduncles of the third less far than the other two, the inner ramus about as far as the outer of the second pair.

Telson short, little longer than its breadth, not reaching the end of the peduncles of the third uropods, narrowing distally to a very small extent, carrying some few cilia at points on the surface.

Length.—The specimen, in the position figured, from the point of the rostrum to the dorsal apex of the second pleon-segment, measured eleven-twentieths of an inch.

Locality.—Station 147, near Marion Island, December 30, 1873; lat. 46° 16′ S., long. 48° 27′ E.; depth, 1600 fathoms; bottom, Diatom ooze; bottom temperature, 34°·2. One specimen.

Remark.—The specific name refers to the great depth from which the specimen was brought up.

Family Epimeridæ, G. O. Sars, 1882.

In 1870 Boeck established the Epimerinæ as twelfth subfamily of the Gammaridæ, between the Iphimedinæ and Dexamininæ; in his latest work he retains the subfamily unaltered, but places it fifth, immediately after the Oedicerinæ in the list on page 74, while in the body of the work he places it fourth, preceding the Oedicerinæ. He assigns to it only two genera, *Acanthozone* and *Epimeria*. In 1882 Sars named a family Epimeridæ, including in it the genera *Epimeria*, *Iphimedia*, *Vertumnus*, *Odius*,

Laphystius, *Acanthozone*, thus interposing between the two genera of Boeck's Epimerinæ the four genera which Boeck assigns to the subfamily Iphimedinæ, but this union of the two groups scarcely seems admissible in view of the marked distinction exhibited by the mouth-organs respectively of the one and the other. Boeck gives the following definition of the Epimerinæ :—

"*Upper Lip* very broad, apically little insinuate.

"*Mandibles* very strong, apically broad and dentate; the secondary plate robust and dentate; the spines of the spine-row numerous, broad, lanceolate, and serrate on the convex margin.

"*First Maxillæ* strong; the palp two-jointed, its second joint apically armed with few teeth; the inner plate furnished with many setæ on the inner margin.

"*Second Maxillæ* broad.

"*Maxillipeds* with the outer plates broad and dentate; the palp elongate, robust, its last joint unguiform.

"The body very thick, robust, carinate and dentate (spinis armatum). The side-plates large, rigid. The eyes prominent.

"*Antennæ* with long flagella; the *Upper Antennæ* without accessory flagellum.

"*First* and *Second Gnathopods* slender; the rest of the legs strong.

"*Uropods* biramous; the second pair shorter than the first, with the inner ramus a little longer than the outer; the third pair with the rami equal in length.

"*Telson* rigid, of moderate size, apically a little incised."

Genus *Epimeria*, Costa, 1851.

1851. *Epimeria*, Costa, in Hope's Catal. Crost. Ital., p. 46.
1853. „ Costa, Rend. Soc. r. Borb.
1857. „ Costa, Ricerche sui Crost. Amf. Nap., pp. 175, 197.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 153.
1867. „ Costa, Saggio coll. Crost. Medit., No. 45.
1869. „ Norman, Last Report Dredging, Shetland, p. 280.
1870. „ Boeck, Crust. amph. bor. et arct., p. 105.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 232.
1878. „ Chatin, Ann. des Sci. Nat., sér. 6, Zool. Tome vii.
1879. „ Sars, Crust. et Pycn. nova, p. 450.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 100.
1885. *Acanthonotus*, Carus, Prodr. Faunæ Mediterraneæ, p. 410.
1885. *Epimeria*, Sars, Den norske Nordhavs-Exp., p. 166.

For the original definition, see Note on Costa, 1851 (p. 250). Boeck defines it thus :—

"Segments of the trunk carinate.

"Four anterior pairs of side-plates very long, narrow, towards the apex acuminate, rigid; the fourth and fifth pairs prominent.

"The frontal rostrum very large and curved between the antennæ.

"In the *Third*, *Fourth* and *Fifth Peræopods* (and especially in the *Third* and *Fourth*) the first joint only a little dilated.

"*Third Uropods* with very narrow rami."

Epimeria loricata, G. O. Sars (Pl. LXVIII.).

1872. *Epimeria coniger* [*cornigera*], Whiteaves, Ann. and Mag. Nat. Hist., ser. 4, vol. x.
1874. „ *cornigera*, Verrill, Amer. Journ. Sci. and Arts, III. vii. pp. 407, 411.
1874. „ „ Whiteaves, Amer. Journ. Sci. and Arts, III. vii. p. 213.
1875. „ „ Verrill, Amer. Journ. Sci. and Arts, ix. p. 414.
1879. „ *loricata*, Sars, Crust. et Pycn. nova, p. 450.
1881. „ „ S. I. Smith, Crust. New England, p. 447.[1]
1882. „ „ Sars, Oversigt af Norges Crustaceer, p. 100.
1883. „ *conspicua*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. ix. p. 204.
1885. „ *loricata*, Sars, Den norske Nordhavs-Exp., p. 166, pl. xiv. fig. 2.

The Rostrum projecting almost to the end of the third joint of the upper antennæ, long, acute, apically depressed, laterally and inferiorly carinate, longer than the part of the head to the rear of it; there is a minute angular projection of the sides of the head between the upper and lower antennæ, and the lower front angle of the head is acute. A central carina traverses the back from the first segment of the peræon, on which it is slight and blunt, to the fourth segment of the pleon, attaining its greatest development on the first three pleon-segments; it is constituted by backward-directed processes almost nose-like in profile, all but the first three or four being sharp-edged and very prominent; on the third and fourth segments of the pleon, and to a slight extent on the second, there is shown a tendency to develop an anterior process; on either side a lateral carina is formed by an oblique ridge on each segment running downwards and backwards, the peræon-segments (of which the fourth and fifth are the broadest) showing several small tubercles below the ridges, the first two segments of the pleon showing two, the third three prominent tubercles behind close to the hind margin, and another lower down, while on the fourth pleon-segment there is a single lateral tubercle and an arched ridge below it; the first three pleon-segments have the postero-lateral angles produced into a short sharp point, which in the second and third is slightly upturned; in the second segment the antero-lateral angle also forms a backward-directed tooth.

Eyes prominent, hemispherical, adjoining the lateral tooth on each side of the head. They are, according to Sars, "a rich vermilion in colour."

Upper Antennæ.—Peduncle short, first joint longer than the second and third united, not twice as long as broad, with a group of spines at the lower distal angle; the second joint a little longer than wide, with groups of spines at the middle and

[1] The references to the American Journal of Science are borrowed from Professor Smith's paper.

apex of the lower margin, third joint shorter and narrower, with long slender spines at the lower apex; flagellum of more than twenty-eight joints, the first longer than the third joint of the peduncle and equal to the four following joints of the flagellum, with five groups of setules on the under side; the secondary flagellum of one short narrow joint, almost rudimentary, as in *Epimeria cornigera* of Fabricius. Sars, on the other hand, says, "secondary flagellum entirely wanting."

Lower Antennæ.—The peduncles and flagella longer than those of the upper antennæ; first three joints short, distally emarginate, the gland-cone long and narrow; the third joint with slender spines at the lower apex; the fourth joint equal in length to the preceding three united, with spines on the lower margin; the fifth shorter than the fourth; there are short hairs or spinules on various parts of the peduncle; the flagellum of fifty joints, or more, the first equal in length to four or five that come next, the terminal joints slender, longer than the earlier except the first.

Upper Lip broad and deep; apical margin narrowed, in the slightest degree emarginate and minutely furred.

Mandibles.—The cutting plate narrow, slightly clasping the secondary plate, its long edge divided into about nine teeth, of which the last four or five are prominent; the secondary plate on the left mandible with the oblique edge divided into five teeth, of which the lowest is the most produced; on the right mandible this plate is slighter, has a much narrower distal edge, divided into one long tooth and three minute denticles; spine-row of some fifteen denticulate spines with some that are shorter and smooth, or setiform and ciliated; molar tubercle long, prominent, with a ciliated ridge along the inner surface, the dentate crown very small; there is a process on the inner surface between the molar tubercle and the palp, which is set just over it; the second joint of the palp scarcely so long as the third, carrying several long slender spines mixed with some that are shorter along the inner margin, beginning below the centre; the third joint a little curved, with the inner margin less so than the outer, fringed along the inner margin with numerous spines of different lengths, three of those at the apex being strongly pectinate.

Lower Lip.—The principal lobes widely dehiscent, each carrying at the apex a short but dense row of blunt-headed cilia, the margins ciliated, a long dense row of cilia on the surface within the inner margin; the mandibular processes short, divergent.

First Maxillæ.—Inner plate short and broad, with nine plumose setæ on the oblique distal margin; the outer plate broad, with eleven variously dentate spines on the obliquely truncate distal margin, the inner part of which is ciliated; the long curved second joint of the palp reaches beyond the outer plate, and on its irregularly toothed distal margin carries four spine-teeth, the outermost the longest, with four or five seta-like spines on the surface within the distal margin.

Second Maxillæ.—Both plates broad, the inner shorter and rather broader than the

outer, its broad oblique distal margin crowded with pectinate spines and having four or five plumose setæ along the lower inner part; there are a few small spines at the distal part of the outer margin; the distal margin of the outer plate carries fifteen long distally pectinate spines, besides several smaller ones, a few of which also are found on the outer margin.

Maxillipeds.—The inner prismatic plates not reaching so far as the distal end of the first joint of the palp, with very numerous setæ on the inner margin, three small spine-teeth and several incurving spines on the distal margin; the outer plates large and broad, but not reaching the distal end of the second joint of the palp; the inner margin almost smooth, with a few seta-like spines on the surface near them; the rounded distal border separated from the inner margin by the apical angle of the latter, set round with eight spine-teeth and four setæ, graduating as usual from the one to the other; first joint of the palp not much shorter than the second, the second much longer than the third; the finger short, its inner margin armed with six teeth; the nail sharp.

First Gnathopods.—Side-plates narrow, triangular, extending a little below the lower angle of the head, channelled at the back, the apex of the hind margin forming the point of the triangle. The first joint reaching beyond the side-plate, bent at the upper part, both margins carrying numerous long setæ, the front margin, much of which is straight, having also many spines, the third joint longer than the second, both with spines at the apex; the wrist subequal in length to the hand, twice as long as broad, with four large groups of spines on the hinder margin, and one at the apex of the front; the hand oblong, a little broader at the palm than at the base, with short spines at the apex in front, a group about one-third of the hand's length from that apex, several on the inner surface and hind margin; the serrate palm is connected by a gentle curve with the hind margin, which is here finely pectinate, some rather stronger spines being inserted on the surface near; the finger strong, much curved at the slender nail, reaching beyond the palm border, and having its inner edge armed with twelve teeth, or rather spines, since they appear to be inserted in the margin, not to be part of it.

Second Gnathopods.—Side-plates rather longer than the preceding pair, and a little more squared below. The limb like the preceding, but the joints, especially the hand, a little longer; many of the spines in both gnathopods pectinate on two edges.

First Peræopods.—Side-plates similar to the preceding pair, but longer and broader, the lower edges of the first three side-plates forming a continuous line. First joint of the limb reaching below the side-plate, carrying long setæ and short spines on the margins; second joint short, with spines at the apex before and behind, this and the remaining joints as in the following pair.

Second Peræopods.—Side-plates with the front margin long and sinuous, ending below in a sharp angle which points backwards, the hind margin excavate about a third of its length, then with a deep curve joining the front margin at its apex; the hinder

part of the plate is deeply channelled and below the excavation sends back a long process on the inner side, which interlocks it with the deep channelling of the front of the following segment. First joint of the limb not reaching below the side-plate; third joint rather longer than the fourth, with spines at four or five points behind, and spinules here and there on the front margin and surface; fourth joint subequal in length to the fifth, armed like the third; fifth joint with spines at seven points of the hind margin, the spines shorter than on the two preceding joints; the finger strong, much shorter than the fifth joint, nail sharp.

Third Peræopods.—The lower apex of the side-plate pointing downwards and backwards, the free front margin continuing the curve of the free hind margin of the preceding plate, the hind margin slightly toothed near the centre. The first joint reaching below the side-plate, a little wider above than below, channelled behind, distally lobed on both edges, the inner lobe crenulate, the front margin carrying several groups of spines and near the top some long setæ; the short second joint distally lobed on both edges behind, carrying some short spines in front; the remaining joints similar to those of the preceding pair, but longer and stronger. The integument of the limbs and apparently of the whole structure is covered with scale-markings.

Fourth Peræopods.—The side-plates short and thick, channelled below, on the outer surface a vertical ridge running down to a central apex. The first joint more expanded than in the preceding pair, the inner side developing a wing with convex hind margin, crenulate at the lower end; the following joints as in the preceding pair, except that the third, fourth, and fifth are longer.

Fifth Peræopods.—Side-plates small, not pointed. First joint of the limb pear-shaped, a little longer than that of the preceding peræopods and much more expanded behind, except at the distal lobe, which overlaps the short second joint; the remaining joints as in the two preceding pairs, but shorter than in either.

Pleopods.—Coupling spines very small, the base broader than the shaft, with six retroverted teeth (including the apical) along one side in succession; cleft spines eight or nine, with long arms to the cleft, the outer little longer than the inner; joints of the rami numbering from twenty-four to twenty-seven on the first pair.

Uropods.—The peduncles of the first pair a little shorter than the subequal rami, which reach as far as or beyond the second, but not so far as the third pair; peduncles of the second pair shorter than the rami, the outer ramus shorter than the inner; peduncles of the third pair short, the rami long, broadly lanceolate, subequal, closely overlapping. The marginal spines throughout are small.

Telson little longer than broad, reaching beyond the peduncles of the third uropods, distally with a triangular emargination, which with the incurving of the lateral margins forms on either side a triangular apex.

Length.—The length of the largest specimen, in a straight line from the tip of the

rostrum to the extremity of the third uropods, was four-fifths of an inch. In Den norske Nordhavs-Expedition, p. 167, Sars says, "Length of the largest of the specimens collected about 40 mm., for an Amphipod a truly imposing size."

Locality.—Station 49, south of Halifax, Nova Scotia, May 20, 1873; lat. 43° 3′ N., long. 63° 39′ W.; depth, 85 fathoms; bottom, gravel, stones; bottom temperature, 35°. Three specimens. Dredged.

Remarks.—This species I at first named *Epimeria conspicua*, though with some doubt as to its distinctness from the species *Epimeria loricata*, of which G. O. Sars had given a preliminary description. The further description and admirable figure since given by Sars of his species show clearly that *Epimeria conspicua* must rank as a synonym. Of this indeed I had earlier become aware, as upon my application to Mr. Sidney Irving Smith for specimens of *Epimeria loricata*, he with his accustomed kindness sent me specimens from lat. 38° 37′ 30″ N., long. 73° 11′ 0″ W., which agree too minutely with the Challenger specimen to admit any question of specific distinctness. Two of these specimens were considerably larger than the largest Challenger specimen, and retained, and still retain, traces of bright red colouring, of which the Challenger specimens show not a vestige. Sars says "Colour a gorgeous red," and again, "Colour a magnificent coral-red, a trifle more vivid on the posterior margin of each segment."

In Boeck's definition of *Epimeria*, the character "Pedes saltatorii ultimi paris ramis perangustis" is not appropriate to the present species.

Family Iphimedidæ.

In 1870 Boeck made the Iphimedinæ the eleventh subfamily of the Gammaridæ, placing in it the genera *Vertumnus*, *Iphimedia*, *Odius*, and *Laphystius;* in his later work he made it the seventh subfamily of the Leucothoidæ, with the same genera, but substituting the name *Acanthonotozoma* for the preoccupied *Vertumnus*, and in the table of errata reading *Lafystius* in place of *Laphystius;* in the body of the work the Iphimedinæ appear as the fifth subfamily of the Gammaridæ, but the editor explains (p. iv.) that this was due to a wrong arrangement of the manuscript, being contrary to the scheme of classification given on page 74. As already noted, Sars in 1882 placed the genera assigned by Boeck to the Iphimedinæ in the family Epimeridæ. The characters most open to observation certainly unite the two groups very closely, but on the other hand they are rather sharply distinguished by the mandibles and maxillipeds. I rely upon Boeck's definition of the Iphimedinæ as being almost equally applicable to the new family Iphimedidæ, which is new chiefly in the form of the name; the definition is as follows:—

"*Upper Lip* elongate, apically strongly insinuate.

"*Mandibles* elongate, often strong, apically produced, little or not at all dentate; secondary plate also produced and narrow, molar tubercle little, often obsolete; palp elongate, robust, three-jointed.

"*Lower Lip* with the inner plate small, situated near the apex.

"*First Maxillæ* more or less elongate; the palp sometimes long, two-jointed, sometimes almost obsolete, one-jointed.

"*Maxillipeds* with the inner plates long, narrow, furnished only with setæ; the outer plates tolerably large or of moderate size and little setose; the palp not very elongate, its last joint not unguiform; the two last joints of the palp sometimes absent.

"Body either compressed, thick, and furnished with large side-plates, or [subdepressed] not depressed, and furnished with smaller side-plates.

"*Upper Antennæ* without accessory flagellum.

"*First* and *Second Gnathopods* sometimes slender and not subchelate, sometimes robust and subchelate.

"*First* and *Second Peræopods* strong.

"The *Fourth Peræopods* longer than the *Third* and the *Fifth* than the *Fourth*.

"*Uropods* biramous.

"*Telson* small, sometimes apically incised."

It is obvious that the words "non depressum" applied to the body, although occurring in both of Boeck's works, are due only to an accidental error, and must be corrected into "subdepressum," the word actually given in the account of *Lafystius*, the only genus which can be in question. The description given of the *Upper Lip*, which probably induced Boeck to transfer the Iphimedinæ from the Gammaridæ to the Leucothoidæ, is itself open to criticism, as inapplicable at any rate to some of the genera, and it should, therefore, in my opinion, be removed from the definition. To include the new genus *Acanthechinus*, I propose to make a slight change in the account of the maxillipeds, describing the last joint as "not *always* unguiform," and in the account of the mandibles to say that the molar tubercle is "*generally* little."

Genus *Acanthechinus*, n. gen.

General habit rigid, developing long pointed processes.

Mandibles having a long palp, with a process on the first joint, the third joint not shorter than the second; the spines of the spine-row differing greatly in size and shape; the molar tubercle very prominent.

First Maxillæ with the inner plate small, carrying three plumose setæ at the apex; the first joint of the palp not more than half the length of the second.

Outer plate of *Second Maxillæ* broader than the inner; the inner margins of the plates not fringed with spines or setæ.

Palp of the *Maxillipeds* slender, the first joint longer than the second, the fourth short, unguiform.

Both pairs of *Gnathopods*, but especially the second, of great length and tenuity, the wrist much longer than the elongate hand, the finger very small yet making the hand subchelate.

The Second Uropods intermediate in length between the first, which are longer, and the third.

The Telson undivided.

The generic name is derived from the Greek words ἄκανθα, a spine, and ἐχῖνος, a hedgehog or sea-urchin. The genus appears to come near both to Boeck's subfamily Epimerinæ and his subfamily Iphimedinæ, disagreeing from his definition of the latter, however, in having the last joint of the maxilliped palp unguiform. From *Acanthonotozoma* of Boeck it differs in respect of the first maxillæ and the gnathopods, and in other points. With *Iphimedia* it is to a certain extent allied by the gnathopods, which nevertheless are to some extent unique. From Boeck's *Acanthozone*, with which I at first identified it, it is separated by the spine-row of the mandibles, the inner plate of the first maxillæ, the outer plate of the maxillipeds, in respect of the characters assigned to these parts in the definition of the subfamily Epimerinæ, while the gnathopods in the two genera are also very different.

Acanthechinus tricarinatus, Stebbing (Pls. LXIX., LXX.).

1883. *Acanthozone tricarinata*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 205, March 1883.
1885. „ „ Stebbing, Narr. Chall. Exp., vol. i. part ii. p. 621.

Body cylindrical, except the after part of the pleon, which is a little depressed and strongly flexed.

Head very small, almost concealed, with a small rostral angle, and two small adjacent lateral lobes on either side; each segment of the peræon armed with three large pointed processes, three-sided, with sharp, serrate edges, the central connected by a transverse ridge on each side with the lateral, all three rising on the hinder part of the segment; the central process on the first segment is bifurcate, the front arm pointing forwards, the hinder backwards, which is the direction assumed by those on the following segments; the length of the processes increases in each segment successively. The first segment of the pleon has a long central process, like that on the last segment of the peræon, and on each side two tubercles, one below the other, at a little distance from the hind margin; the hind margin itself juts out a little before reaching the angle with

the lower margin; the second segment is similar to the first, but deeper; the third has a smaller central process with a tubercle or denticle below on each side, a little in front, while to the rear from the hinder margin rise three processes, or one that is tridentate, while beyond this on either side there is an upward-bent lateral process; the fourth segment begins with a small hump and a depression, the latter being followed by a central process with serrate edges, and this by a second at the distal end of the dorsal line; the fifth segment is short and unarmed; the sixth, also short, carries a central, and on either side of it a lateral, process.

Eyes not observed.

Upper Antennæ.—The first joint of the peduncle distally dilated and produced in three long processes, one shorter than the other two; the second joint subequal in length, distally produced in two long processes; the third joint much shorter and more slender, not nearly reaching to the end of the processes of the preceding joint, with two small distal angles; the flagellum broken, but at least of more than eight joints, the first very long, longer than either the first or second of the peduncle apart from their processes, equal to about four of the succeeding joints of the flagellum; the other joints successively diminish in thickness, but not in length, each carrying a small distal spine in a group of setules; the first joint has three such groups, and from the fifth to the eighth there is an additional group at the centre of the margin.

Lower Antennæ.—The composite first and second joints show two large processes, the upper with its upper margin serrate and carrying spines, the lower much smaller, both apparently forming part of the first joint, while the second is not prominent, with the gland-cone small and obscure; the third joint has one rather long, and two short, distal processes; the fourth joint, much longer than the third, has two long distal processes, the lower longer than the upper, and two small processes, one on either side between the larger ones; the fifth joint is long and straight, with two small adjacent distal processes above and one below, and is nearly as long as the total length of the previous joint; the flagellum, rather longer than the peduncle, consists of eleven, or possibly twelve joints, of which the first is very long and tapering, equal to the four following joints united, which with the rest successively decrease in thickness but not in length.

Upper Lip with the distal margin bilobed, one lobe rather larger than the other, the ciliation not strong. There appear to be traces of a small inner plate, adnate at the distal corners to the surface of the outer.

Mandibles.—The shaft much bent so as to present a deep concavity between the base and the palp, where it makes a right angle, the upper margin passing in a sinuous line to the narrow cutting plate, which is apically divided into some small teeth, about five or six in number, and lightly clasps the secondary plate, which is of nearly equal length, apically divided into five teeth on the left mandible, two of the teeth being double; on the right mandible this plate is much more slender, and so far as observed has much

smaller teeth; adjoining the secondary plate is a broad, backward curving spine, of two-thirds the length of the secondary plate, with its broad end divided into sharp teeth of different lengths; to this succeeds a much shorter spine with two teeth at the end, and this again is followed at short intervals by three successively diminishing spines, so short as to be rather called teeth than spines, the first of the three appearing to be a process of the margin itself; between the shaft and this very peculiar spine-row projects the very prominent molar tubercle, its round or oval crown set thickly with rows of sharp teeth, too large to be called denticles; a process is placed between the molar tubercle and palp, a little to the rear, the shaft behind this appearing to be double-bladed; the first joint of the palp, which is comparatively long, has at the upper end, projecting from the outer surface, a tooth-like process which seems to be movable; the second joint, more than twice as long as the first, is rather shorter than the third, and has a short seta at the apex; the third joint has numerous distally pectinate spines arising not far from the base a little within the inner margin, which they closely fringe at the distal end, those at the apex being long, one at the apex being strongly pectinate on one edge for two-thirds of its length, and more finely pectinate on two edges for the remaining third; the hind margin not far from the base carries a row of ten or eleven setæ, while almost the whole of the outer surface, which is ridged and two-sided, is covered with lines of short spines or denticles. In the Plate the inner surface is shown of the left mandible, the outer surface of the right.

Lower Lip.—The principal lobes large, together forming a half circle, their inner margins not greatly dehiscent, the inner lobes seemingly adnate to the outer; the mandibular processes somewhat pointed.

First Maxillæ.—Inner plate narrow, with three plumose setæ on the apex; outer plate long, the apical margin narrow, carrying seven spines, the inner with their bases covered by a brush of cilia; three of the spines are broken; all appear to be more or less strongly dentate, the central one having three lateral teeth, the outermost one or two lateral teeth; the first joint of the palp is rather broader than the second and about half its length; the second joint has on its indented apical margin seven spines, pectinate on both edges, and on the surface adjoining these five more, similarly armed but longer and more setiform.

Second Maxillæ.—The plates broad, the outer broader as well as longer than the inner, the broad distal margins of both fringed with very numerous pectinate spines of different sizes, some large and strong; the outer and inner margins of both devoid of spines.

Maxillipeds.—The inner plates comparatively long, yet not reaching far beyond the base of the first joint of the palp, their inner margins fringed far down with plumose setæ, which pass on the surface round the inner apex and fringe the outer part of the distal margin, these appearing rather like curved spines than setæ; the distal margin

carries two spine-teeth at its inner apex, and a larger one at the centre; the outer plates broad, reaching just beyond the first joint of the palp; the inner margin thin and smooth below, above finely pectinate, the pectination passing round part of the apex, and the appearance of it repeated three or four times over in parallel lines on the surface, which carries two rows of longer and shorter setæ, neither of them very numerous; there are also setæ round the outer part of the distal margin; the first joint of the slender palp is longer than the second, the second a little longer than the third, the finger slight, half the length of the second joint; the first joint has a spine or two at the inner apex, the second some along the upper part of the inner margin, and the third several along the upper two-thirds of that margin, these spines being pectinate on two edges at the centre.

First Gnathopods.—The side-plate takes the form of a triangular process directed forwards, carinate below, channelled above, sharply pointed, with the sides near the point serrate. The limb is long and slender, the first joint being the thickest part; this is slightly sinuous, very elongate, a little shorter than the wrist and hand united; it has some minute spinules on the margins and a spine on the hinder apex; the second joint has the hinder margin straight, much longer than the front, with some small spines at the apex; the third joint is longer than the second, the front margin very short, the hinder with a row of spines along it near the sharply pointed apex, no part of the very oblique lower margin being free; the wrist longer than the hand and more than twice as long as the third joint, carries spines all along the free hind margin, pectinate at or near the centre; the hand long and slender, about five times as long as its greatest breadth, which is near the base; it has a spinule here and there on the hind margin, and at the slightly serrate distal end of it a row of five short spines, each with an accessory thread, and accompanied by one or two setules; these spines may be considered as occupying the palm margin together with one stronger, curved, closely set within with denticles, at a little distance from the others and close to the finger hinge; over these spines the small finger closes, having at its centre a strong tooth, with two broad apically hooked setules arising at its base; beyond the tooth the finger is prolonged in a slender much-curved nail.

Second Gnathopods.—The side-plates are similar to those of the preceding segment except that the carina appears above instead of below, and the triangle is a little longer and thinner. The branchial vesicle is about the length of the side-plate, without folds, a somewhat bent oval. The marsupial plates are narrow, longer than the branchiæ, with no setæ present, but some setules and marks of the points at which setæ apparently had been or were to be developed. The limb membranaceous and otherwise similar in structure to the first gnathopods, but much longer; the first joint a little longer than the third and fourth united; the third joint with fewer spines than in the preceding pair; the wrist of great length and tenuity, having scarcely any armature, the hand of about

the same length as in the first gnathopods or a little longer, thinner, similarly armed, but with the palmar spines spread over rather more space; the finger similar; the wrist in this remarkable limb is three times as long as the elongate hand.

First Peræopods.—Side-plates forming below a triangular channelled and carinate serrate-edged process as in the preceding pairs, but also throwing out from the centre of the upper part a similar process which takes a backward curve. The branchial vesicles and marsupial plates similar to those of the preceding pair, but rather larger. The first joint reaching beyond the side-plate, very slightly produced and furnished with spinules on the hinder apex; the second joint produced and furnished in like manner, and with one or two spinules on the hind margin on the inner surface, each of these joints having a small semicircular lobe on the distal margin; the third joint, which is nearly as long as the first, is distally a little expanded and a little produced in front; it has three or four spinules on the rather irregular margins both in front and behind; the fourth joint, which is considerably shorter, has four spinules on the front margin, and short spines at six points of the hind margin; the fifth joint longer than the fourth but shorter than the third, has seven or eight spinules in front, spinules at eight points behind, the distal margin slightly lobed on the inner surface; the finger is short and broad except at the curved tip, and at intervals along the inner edge carries some eight spinules; there is a cilium at the base of the nail, and some cilia apparently along the hind margin.

Second Peræopods closely resembling the first; the side-plates throwing out an angle behind to assist in interlocking it with the following side-plate.

Third, Fourth, and Fifth Peræopods.—The side-plates of these three pairs are much alike, the basal part or body of the plate successively smaller, the back-turned serrate process successively longer; when examined from below there is seen to be a flat process or lobe to the rear of the great process, the lower angle of which is turned forwards. The limbs are similarly formed, the fourth rather longer than the third, the fifth than the fourth. The first joint is so much channelled that it presents four longitudinal carinæ or ridges, its lower hinder margin on the outer surface is produced in a rounded lobe which completely overlaps the short second joint, which like the three following joints is carinate in front; the third joint is decurrent behind with a long pointed process, and has some spinules along the front margin; the fourth joint is rather shorter, similarly decurrent, with spines on the front margin; the fifth joint has the hind margin longer than the front, but without an elongated apex; the front margin has several small spines; the finger is similar to that of the first peræopods.

Pleopods.—The coupling spines very small, with two lateral teeth and an apical one; the cleft spines slender, five in number, at least on one of the pleopods; the joints of the rami from twenty to twenty-three in number.

Uropods.—The peduncles channelled above, all reaching back nearly to the same point, the first pair a little beyond the second, and the second beyond the third, and the

rami in like manner, these being all lanceolate, but not broadly so, and, as well as the peduncles, being bordered with small spines; the peduncles of the first pair longer than the rami, those of the second pair a little shorter, and those of the third pair much shorter; in the first and second pairs the outer ramus a little shorter than the inner, in the third pair the rami equal.

Telson rather longer than broad, somewhat boat-shaped, shorter than the peduncles of the third uropods, the lateral margins and broad distal margin convex.

Length.—The specimen, in the position figured, measured eleven-twentieths of an inch from the front apex of the front (broken) horn of the first peræon-segment to the apex of the horn of the first pleon-segment.

Locality.—Station 150, off Heard Island, February 2, 1874; lat. 52° 4′ S., long. 71° 22′ E.; depth, 150 fathoms; bottom, coarse gravel; bottom temperature, 35°·2. One specimen, female. Dredged.

Remarks.—The specific name refers to the triple carina formed by the processes on the peræon-segments. The animal seems to have developed a spiky process at every available point, so as to become a veritable ball of prickles. Its cylindrical figure distinguishes it strongly from *Acanthonotozoma serratum*, Fabricius, of which Mr. J. Sparre Schneider has kindly sent me specimens. That species is comparatively compressed, has a long rostrum, and no special flexure of the pleon. With *Acanthozone*, Boeck, of which the type is *Oniscus cuspidatus*, Lepechin, the present species agrees in general habit.

Genus *Iphimedia*, Rathke, 1843.

1843. *Iphimedia*, Rathke, Beiträge zur Fauna Norwegens, p. 85.
1846. *Microcheles*, Krøyer, Naturh. Tidsskr., R. 2, Bd. ii. p. 66.
1852. *Iphimedia* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 910, 926.
1855–6. „ (?) Stimpson, Proc. Acad. Nat. Sciences, Philadelphia, vol. vii.
1857. „ Spence Bate, Nat. Hist. Review, vol. iv. p. 229.
1857. „ White, Popular Hist. Brit. Crust., p. 176.
1859. „ Bruzelius, Skand. Amph. Gamm., p. 80.
1860. „ Boeck, Forh. Skand. Naturf. 8de Møde, p. 654.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 123.
1862. „ Bate and Westwood, Brit. Sess. Crust., p. 217.
1864. „ Grube, Beschreib. Amph. istrischen Fauna, p. 202.
1865. „ Lilljeborg, On the Lysianassa magellanica, p. 18.
1870. „ Boeck, Crust. amph. bor. et arct., p. 101.
1874. „ Stebbing, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv. p. 11.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 244.
1880. „ (?) Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 327.
1880. *Panoplæa*, Thomson, Ann. and Mag. Nat. Hist., ser. 5, vol. vi. p. 2.
1880. *Panoplæa*, Thomson, Trans. New Zealand Inst., vol. xiii. p. 212.

1882. *Iphimedia*, Haswell, Catal. Australian Crust., p. 241.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 100.
1883. „ Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 206.
1885. „ Carus, Prodr. Faunæ Mediterraneæ, p. 406.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 504.
1886. *Panoplœa* (*pars*), Thomson and Chilton, Critical List Crust. New Zealand, p. 150.

For the original definition of the genus, see Note on Rathke, 1843 (p. 204). For Krøyer's definition of *Microcheles*, see Note on Krøyer, 1846 (p. 216), and for Thomson's definition of *Panoplœa*, see Note on Thomson, 1880 (p. 524). Boeck defines the genus as follows :—

"*Upper Lip* not much elongated, broad, apically insinuate.

"*Mandibles* a little shorter and broader than in the genus *Vertumnus* [*Acanthonotozoma*].

"*First Maxillæ* with the palp two-jointed, the first joint short; the inner plate smaller than in the preceding genus [*Acanthonotozoma*].

"*Maxillipeds* with the last joint of the palp wanting.

"*First* and *Second Gnathopods* slender, but furnished with a very narrow, cheliform hand.

"Body thick, yet deep; with the side-plates large, rigid."

In the definition of the compared genus, *Acanthonotozoma*, Boeck does not mention the mandibles; of the first maxillæ he says, "inner plate very large, triangular, furnished with many plumose setæ."

Iphimedia pacifica, Stebbing (Pl. LXXI.).

1883. *Iphimedia pacifica*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 207.

The Head almost concealed; the long rostrum, curving slightly downwards, reaches nearly to the end of the first joint of the upper antennæ; the lateral margins of the head below the upper antennæ form two sharp processes, of which the lower is rather the larger; the first segment of the peræon curves over the head and is dorsally longer than any one of the five following segments, but much shorter than the seventh segment; each has the postero-lateral angles acute, forming backward-directed processes, more and more developed in each successive segment, in the last three, and especially in the last, the process becoming prominent and directed a little outwards as well as backwards; in the last peræon-segment and in each of the first two of the pleon there is a pair of large dorsal backward-directed teeth or processes; the first three pleon-segments have an inchoate dorsal carina, the postero-lateral angles produced into an acute upturned tooth, and the hinder margins likewise produced into a sharp tooth near the centre, this tooth in the third segment being longer than the lower tooth and curved upwards at the point; dorsally, the hind margin of the third segment forms a small lobe on either side; the

fourth pleon-segment has a deep transverse dorsal depression; the sixth segment runs out into a sharp point on each side of the telson.

Eyes small, oval, situated near the front of the head almost between the upper and lower antennæ.

Upper Antennæ.—First joint much longer and thicker than the second, distally produced into a long acute tooth, and a shorter one minutely and unequally bifid; the second joint is also distally produced into a bifid tooth of some size on one side and a minute denticle on the other; in the specimen from Station 150 the remainder of the upper antennæ was missing; in a specimen from Kerguelen the third joint was very small, the flagellum longer than the peduncle, of some twenty joints, decreasing in thickness and increasing in length successively downwards (see fig. *a.s.*).

Lower Antennæ.—First joint forming a small lobe on the lower side, the gland-cone of the second joint small, the distal margins of both the second and third joints irregularly dentate; the fourth joint as long as the preceding three united, having distally a produced tooth and a denticle; the fifth joint narrower and rather shorter than the fourth; the flagellum longer than the peduncle, consisting of thirty-five joints, of which the first is the longest.

Upper Lip.—The front plate is wider at the base than at the smooth flattened distal margin, with the sides evenly convex.

Mandibles long and tongue-like, the cutting edge sloping backwards, so that in the row of seven teeth on the right mandible, three large and four small, the top one is the largest and most prominent; it has a small tooth on the outer side of it; on the left mandible the teeth seem to be less numerous and larger; on the right mandible the secondary plate was obscure; on the left it was well defined, long, and strap-shaped, lying close to the lower margin of the principal plate, but not reaching its apex, the upper margin convex, the distal part of the lower cut into four teeth; no spine-row was visible; the molar tubercle on the left mandible is very small, with a narrow crown minutely denticulate; on the right mandible no dentate crown could be perceived; the first joint of the palp is long and distally dilated, with a spine at the inner distal corner, the second joint is longer than the first or third, but is drawn too long in the figures; it has two spines near the inner apex; the third joint is a little longer than the first, the outer margin convex, the surface ciliated, the apex and much of the inner margin fringed with spines. In the figures *m.m.* the new growth of the cutting-plates is seen within the trunk of each mandible, and separate figures more highly magnified are given to show the details of these still-unworn edges. The left mandible is figured on the right, and the right mandible on the left, of the Plate.

Lower Lip thin in texture, the principal lobes dehiscent, with the inner margins straight or slightly concave, the apex angular; the inner lobes are doubtfully distinct from the principal; the mandibular processes are long and divergent.

First Maxillæ.—The inner plates narrow, with seven or eight plumose setæ on the apex and distal part of the inner margin; the outer plates long, with a brush of cilia along the distal part of the inner margin; of the eleven spines on the oblique apical margin, the innermost four have many lateral denticles, the next four or five fewer, and the outermost two have none; the first joint of the palp is long, more than half the length of the second; the second reaches scarcely beyond the outer plate and has several pectinate spines on the distal end.

Second Maxillæ.—The inner plates rather broader and a little shorter than the outer, with numerous strongly pectinate spines passing from the apex of the outer margin in a curve so oblique that it may be reckoned as well part of the inner as of the apical margin; the outer plates have longer spines round the apical margin and descending the inner margin to a very short distance; its sides are nearly parallel.

Maxillipeds.—The inner plates long and narrow, their inner margins fringed with setæ, and the somewhat conical apices also fringed with long plumose setæ; the outer plates are large, with long spines or setæ on the distal part of the inner and outer margins and shorter spines set very closely round the narrowed apical part of the plates. The first joint of the palp is longer than the second or third, with a few setæ along the inner margin and a group at the outer apex; the second joint has also some long setæ at the apex of the straight outer margin, on the inner side it is apically produced, the process being set round with long spines; the third joint is short, with one or two spines on the outer margin, and many long ones from the apex round the distal part of the inner margin; there seems to be no trace of a finger.

First Gnathopods.—The side-plates triangular, the front margin convex, with one or two dentations below, the apex very sharp, the slightly concave hind margin forming a little tooth just before reaching the apex. The limb slight and feeble, much twisted, probably being so when the creature is alive to secure the protection its feebleness requires. The first joint narrowest at the two extremities, the front margin very sinuous, with a few setæ, the hind margin very convex; the second joint as long as the third, apically produced to a point; the third joint with convex margins converging to an apical point; the wrist narrow, a little longer than the hand, which is also very narrow, somewhat curved, the hind margin concave, produced into a small thumb, against which lies a short finger, the two together forming a minute chela, about which four or five setæ of different lengths are arranged; the finger, which is beset with setæ, has a hooked tip, and two retroverted teeth on its inner margin.

Second Gnathopods.—Side-plates not unlike the preceding pair, but longer, more slender towards the apex and more curved, with five teeth or serrations on the lower part of the front, and two at the lower end of the hind margin. The branchial vesicles long and very narrow. The first joint of the limb longer than in the first gnathopods, narrow, not much bent; the second joint shorter than the third; the third widening towards the distal

end, then running out into a point; the wrist subequal in length to the hand, widening a little distally, with some setæ on the hind margin and its apex; the hand long and almost parallel-sided, the straight hind margin being fringed for almost its whole length with pairs or larger groups of long setæ; there are some short setæ near the apex of the front margin; the thumb and finger seem to resemble those of the first gnathopods.

First Peræopods.—Side-plates like the preceding pair, but longer. The third joint of the limb apically decurrent in a short sharp point.

Second Peræopods.—The side-plates with very convex front margin, serrate below, the hind margin concave, forming two large curves separated by a sharp process, the lower curve the longer, serrate near the acute apex. The third joint of the limb as in the preceding pair.

Third Peræopods.—The side-plates bilobed, the hinder lobe having a very acute backward-directed process. The first joint of the limb has the hind margin very sinuous and strongly serrate, forming with the serrate lower margin a sharp backward-directed apical tooth; the second joint is very small; the third is longer than the fourth, being behind decurrent in a long apical tooth; the fifth joint is longer than the fourth, and like both the third and fourth has small spines along both margins; the finger is a little curved, longer than half the fifth joint.

Fourth Peræopods similar to the third, but larger.

Fifth Peræopods.—The side-plates have a backward-directed process as in the two preceding pairs. The sinuous hind margin of the first joint is produced downwards in a sharp tooth at an angle with the lower margin, in other respects the limb seems to resemble the two preceding pairs, but exceeds them in size.

Uropods.—The peduncles of the first pair longer than the rami, the margins and apices carrying rather large spines; the rami long and slender, nearly equal, the outer slightly the shorter, the apical portion in each narrowed so as to look like a nail, yet with no sign of jointing or suture; both rami having marginal spines and pectinate edges; the peduncles and rami of the second pair not reaching so far back as those of the first and third pairs, the peduncles longer than the outer, shorter than the inner ramus, the rami armed like those of the first pair; the peduncles of the third pair much shorter than the ramus, with three acute distal prolongations, two of which are rather long; one of the rami missing, the other long, tapering, with marginal spines and pectinate edges.

Telson concave above, almost oblong, longer than broad, the lateral margins scarcely converging, apically produced to a sharp tooth on either side of the truncate distal border, in the centre of which there is a very small emargination.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the back of the third pleon-segment, about three-tenths of an inch.

Localities.—Station 150, off Heard Island, February 2, 1874; lat. 52° 4′ S., long.

71° 22′ E.; depth, 150 fathoms; bottom, coarse gravel; bottom temperature, 35°·2. One specimen.

Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. One specimen. Dredged.

Remark.—The specific name refers to the ocean in which the specimens were found, and has, it must be allowed, no special appropriateness.

Iphimedia pulchridentata, Stebbing (Pl. LXXII.).

1883. *Iphimedia pulchridentata*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 206.

The Rostrum long, somewhat curved and depressed, rather broad near the base, acute at the apex; the lateral margins of the head produced below and at the centre into two sharp processes, that in the middle curving a little downwards, the lower curving rather upwards; peræon broad across the back, rounded, pleon much more compressed; all the segments of the peræon and the first three of the pleon have the postero-lateral angles sharply produced, in the sixth and seventh segments of the peræon the processes being very long and downward curving, in the second and third of the pleon slightly upturned; the sixth and seventh segments of the peræon have also two, the first and second of the pleon three, the third of the pleon two, large backward-directed processes on either side of the dorsal line, in the peræon-segments the upper pair larger than the lower, both with the upper margin convex; in the first two pleon-segments the upper margin of the upper and the lower of the lowest pair are convex, in the third segment the lower margins of both pairs; the first four segments of the pleon are dorsally carinate, the carina being produced backwards in a large tooth or process, on the top of which in the second and third segments there is a small denticle, while in the fourth segment the process is slightly tip-tilted; the sixth segment is acutely angled beyond the base of the telson; there is a marked transverse dorsal depression on the seventh segment of the peræon and on the fourth of the pleon, the intervening segments having slighter depressions.

The Eyes are round, rather prominent, situated close to the margin of the head below the rostrum.

Upper Antennæ.—The first joint has a tooth near the base, and three large but unequal distal teeth; the second joint is as long as the first, having on one side a small distal tooth, on the other a very long one which outreaches the third joint; the flagellum is missing, but there is present what appears to be a rudimentary one-jointed secondary flagellum.

Lower Antennæ.—The first three joints very short, the first particularly small but produced into a long tooth, the second forming three large pointed processes of differing widths, the widest apparently being the gland-cone, the third joint shorter than the second, with an irregular distal margin carrying a small tooth on one side and a more

prominent one on the other; the fourth joint longer than the preceding three united, distally dilated and produced into large teeth, the lower margin carrying a small spine; the fifth joint as long as the fourth, a little dilated distally, with the lower apex acute, the lower margin carrying a few spinules; the flagellum with twenty-eight joints remaining, of which the first is the longest and shows three or four joints in preparation within it.

Upper Lip.—The distal margin broad, evenly and slightly convex, almost smooth; two blunt tooth-like processes project on either side of the surface of the epistome.

Mandibles narrow and tongue-like, the cutting edge resembling a broad horny tooth not divided into denticles; even in the plates in preparation no such division could be made out; the secondary plate on the left mandible lies close to the lower edge of the principal plate, and from a narrow base expands with a convex upper margin, its distal margin sloping inwards like that of the principal plate, faintly divided into five or six teeth, its greatest breadth about half that of the principal plate, against which it is closely applied; in the other mandible the secondary plate is similar in position but much smaller, strap-like, not reaching the distal border of the principal plate; of spine-row I could discover no trace, nor could I make out any dentation of the molar tubercle; the articulating process is large; the palp set far back, has the first joint rather long, about half the length of the second, the third is longer than the first, shorter than the second, with some spines on the oblique inner margin of the apex. In the figures of the mandibles *in situ* on either side of the upper lip, the outer surfaces are shown, so that the left mandible is to the right, the right mandible to the left; the transparency of the principal plates permits a view of the inner secondary plates.

Lower Lip with the distal margin and much of the surface strongly ciliated, the lobes dehiscent, with a small emargination near the apex of the convex inner margin; the inner lobes so far as observed were narrow; the mandibular processes long, a little bent, very divergent.

First Maxillæ.—The inner plates oval, with ten or eleven plumose setæ passing from the apex some way down the inner margin; the outer plate with a bush of cilia at the upper part of the inner margin, many of them spine-like, and near the apex giving place to broad short spines; of the eleven spines on the distal margin, the two innermost have ten or a dozen lateral denticles, the next pair have, the one three, the other four, stronger teeth, the next pair two apiece, the next pair one and three, and the three outermost which are strong and much curved have no lateral teeth; the first joint of the palp is long, half the length of the second; the second reaches much beyond the outer plate, and carries at the upper part of the inner margin and on the apex many long pectinate spines.

Second Maxillæ.—The inner plates narrow at the base, then widening with a convex inner and straight outer margin, the distal margin broad, obliquely truncate, crowded with

spines, many of which are strongly pectinate; the series is continued some way down the inner margin with spines that are partly pectinate, partly plumose; the outer plates are narrower and longer than the inner; there are many long pectinate spines on the narrow apex, and a little way down the inner margin, besides four or five more slender than the rest down the outer margin.

Maxillipeds.—The inner prismatic plates very long, fringed far down the inner margin with a series of fifteen plumose setæ, this margin ending in a small apical point, the distal margin not broad, but set with two rows of strongly pectinate spines of different lengths, two near the inner apex comparatively short, but still too long to be regarded as spine-teeth; two or three slender spines pass down the outer margin. The outer plates scarcely larger than the inner, not reaching the distal end of the palp's second joint, the inner margin in its upper part fringed with feathered setæ, near the rather pointed apex becoming serrate and carrying pectinate spines; four or five feathered setæ pass down the outer margin; the three joints of the palp are rather narrow, the first a little longer than the second, with a few setæ on the inner margin and outer apex, the second with several long setæ near and at the apex of the inner margin; the third about as long as the second, with numerous setæ along the upper half of the inner margin, and at least one long pectinate spine at the apex; no trace of a finger could be perceived among the parasites which beset the apical setæ.

First Gnathopods.—The side-plates have the narrowed distal portion divided into two large acute processes, of which the hinder curves slightly forwards, and has a small denticle on its front or inner margin; the front process has a small denticle on the front margin, below which it slopes slightly backwards. The limb closely resembles the first gnathopods of *Iphimedia pacifica*, but the specimen being larger some of the details are more easily observed; thus the tip of the thumb has a small spine, against which the hooked tip of the finger impinges; at the base of the thumb there are three or four pectinate setæ and two long ones on its inner margin, the finger having two dorsal setæ, one near the base, the other near the tip, the pectination of these setæ being turned backwards in the limb as mounted for the microscope, but this is perhaps accidental; besides the strong apical hook, the finger has at least one retroverted tooth on the inner margin.

Second Gnathopods.—The side-plates similar to the preceding pair, but narrower, a little longer, with the hinder process rather more produced in comparison with the front one. The limb is very like that of the second gnathopods in *Iphimedia pacifica;* the first joint widens a little distally, is as long as the wrist and hand united, and much broader than either; the second joint is longer than the third; the wrist has six groups of setæ along the distal half of the hind margin; there are seventeen or eighteen groups of long setæ along the distal two-thirds of the hand's hind margin, and eight groups along the distal half of the front margin.

First Peræopods.—The side-plates similar to those of the preceding pair, a little

broader and longer. The limbs of this and the following pairs robust, not feeble like the gnathopods. The first joint not reaching beyond the side-plate; the second joint short, the third longer than the fourth, with spines at four points of the hind margin, the front margin apically acute and a little decurrent; the fourth joint with spines at three points of the hind margin, distally widened, and apically acute in front; the fifth joint about as long as the third, with spines at four points behind and at two or three in front; the finger more than half the length of the fifth joint.

Second Peræopods.—The side-plates with the front margin convex, produced below the preceding pair in a sharp apex, the hind margin concave in two curves separated by a sharp process, the lower curve being much the longer.

Third Peræopods.—Side-plates bilobed, the hinder lobe the larger, its hind margin forming two large processes, of which the upper is the longer and narrower, curving downwards. The first joint of the limb long, with the front margin nearly straight, apically forming a small sharp tooth, the hind margin deeply cut into five acute, large, unequal teeth or processes, of which the lowest is the smallest; the second joint short, the front margin apically produced into a sharp tooth; the third joint with one or two spines on the front margin, the hind margin produced in a long, very acute, decurrent apex. The rest of the limb missing.

Fourth Peræopods.—The side-plates broader than the preceding pair, not bilobed, the hind margin produced into two very long, narrow processes. The first joint like that of the third peræopods, but larger and with larger processes; the second and third joints also a little longer; the fourth joint short, with spines at three points in front, widened distally, the hind margin apically acute, almost entirely overlapped by the decurrent apex of the third joint. The rest of the limb missing.

Fifth Peræopods.—Side-plates similar to those of the preceding pair, but of the hind processes the upper is larger and much more produced than the lower. First joint of the limb not unlike that of the fourth peræopods, but much larger, the uppermost process of the hind margin small, with an extra denticle on the top of it, the process next below and the process lowest but one being both very much produced; the third joint longer than in the preceding pair, with spines at three or four points on the hind margin; the fourth joint longer than in the preceding pair, having a little spine within the slightly produced acute hinder apex; the fifth joint longer than the fourth, not quite so long as the third, slightly curved, with spines at four points of the front, and three or four of the hind margin; the finger not half the length of the fifth joint, rather broad, curved at the nail, with a dorsal cilium close to the hinge, another at the base of the nail, and four spinules along the convex hind margin.

Uropods.—Peduncles of the first pair a little longer than the rami, armed with marginal and apical spines; the rami long and slender, subequal, with spines on both margins, and each ending in a small nail; the peduncles and rami of the second pair

not reaching back so far as those of the first and third pairs, the peduncles about as long as the inner ramus, with spines fringing the lower half of one margin, the other smooth, except for an apical spine; the outer ramus shorter than the inner, each ramus having marginal spines and an apical nail (in one of the second uropods the inner ramus was less elongate than in the other); the peduncles of the third pair much shorter than the rami, apically cut into three unequal teeth; the rami broad, lanceolate, unequal, with marginal spines and some feathered setæ.

Telson longer than broad, the sides converging to form an acute apex on either side, the two apices being separated by an emargination of about equal length and breadth, the length being between a third and a quarter of the total length of the telson. The actual apices are perhaps rounded, each carrying a sort of nail broad at the base and acute at the tip.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the back of the third pleon-segment, very nearly half an inch.

Locality.—Station 151, off Heard Island, February 7, 1874; lat. 52° 59′ 30″ S., long. 73° 33′ 30″ E.; depth, 75 fathoms; bottom, volcanic mud. One specimen.

Remarks.—The specific name refers to the handsome dentation of the back and the peræopods.

Genus *Lafystius*, Krøyer, 1842.

1842. *Lafystius*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 156.
1852. *Laphystius*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 913.
1855. „ Liljeborg, Om Hafs Crustaceer vid Kullaberg i Skåne, p. 132.
1857. *Darwinia*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 9.
1857. „ White, Popular Hist. Brit. Crust., p. 176.
1859. *Laphystius*, Bruzelius, Skand. Amph. Gamm., p. 98.
1862. *Darwinia*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 108.
1862. *Lafystius*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 109.
1862. *Darwinia*, Bate and Westwood, Brit. Sess. Crust., p. 182.
1865. *Laphystius*, Lilljeborg, On the Lysianassa magellanica, p. 18.
1870. *Dermophilus?*, Beneden and Bessels, Mém. cour. Acad. Roy de Belgique, vol. xxxiv.
1870. *Laphystius*, Boeck, Crust. amph. bor. et arct., p. 102.
1873. *Ichthyomyzocus?* (*pars*), Hesse, Ann. d. Sci. Nat., sér. 5, t. xvii. art. 21.
1874. *Laphystius*, S. I. Smith, Invert. Animals Vineyard Sound, p. 557.
1875. „ Schiødte, Krebsdyrenes Sugemund, Nat. Tidsskr., R. 3, Bd. x. p. 241.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 250.[1]
1878. *Darwinia*, Spence Bate, Crust. in Couch's Cornish Fauna revised and added to, p. 49.
1886. *Laphystius*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 503.

For the definition of the genus see Note on Krøyer, 1842 (p. 199).

[1] On p. 712 *Laphystius* is corrected to *Lafystius*.

Lafystius sturionis, Krøyer (Pl. CXXXVII. D).

1842. *Lafystius sturionis*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 157.
1855. *Laphystius sturionis*, Liljeborg, *loc. cit.*
1857. *Darwinia compressa*, Sp. Bate, *loc. cit.*
1857. „ „ White, *loc. cit.*
1859. *Laphystius Sturionis*, Bruzelius, *loc. cit.*
1861. *Lafystius Sturionis*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 110.
1862. *Darwinia compressa*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 108, pl. xvii. fig. 7.
1862. „ „ Bate and Westwood, Brit. Sess. Crust., p. 184.
1870. *Laphystius Sturionis*, Boeck, Crust. amph. bor. et. arct., p. 103.
1873. *Ichthyomyzocus morrhuæ?*, Hesse, *loc. cit.*, p. 7.
1874. *Laphystius Sturionis*, S. I. Smith, Invert. Animals Vineyard Sound, pp. 457, 557.
1875. „ „ Schiødte, Krebsdyrenes Sugemund, p. 237, Tab. v. figs. 9–18.
1876. „ „ Boeck, De Skand. og Arkt. Amph., p. 252, pl. xix. fig. 6.
1878. *Darwinia compressa*, Spence Bate, Crust. in Couch's Cornish Fauna revised and added to, p. 49.

Locality.—The specimens were labelled as having been taken "Parasitic on *Cottus*, Halifax, May '73." This refers therefore to a point in the voyage between Stations 48 and 49.

Remark.—The mouth organs of this species are beautifully drawn by Schiødte; they are figured in this Report, as well for identification of the species, as to give facility of comparison with the corresponding parts in kindred genera.

Among numerous drawings of Amphipoda by Sir Joseph Hooker, prepared during the Antarctic expedition of 1840–41, there is one of a species in many respects resembling *Acanthonotozoma cristatum*, Owen, and like it reddish-white in colour, with red eyes. If this fine species should prove to belong to the genus named it will be an addition to the family Iphimedidæ.

Family Atylidæ, G. O. Sars, 1882.

In 1865 Lilljeborg made the Atylinæ the eighth subfamily of the Gammaridæ, with the definition "Antennæ superiores flagello appendiculari carentes. Oculi compositi. Pedes trunci (thoracici) 7:mi paris antecedentibus minime vel parum longiores, segmento ultimo unguiformi. Laminæ pedum maxillarium bene evolutæ." To it he assigned the genera *Odius*, *Iphimedia*, *Laphystius*, *Calliopius*, *Paramphithoë*, *Atylus*, *Dexamine*, *Acanthonotus*, the first three and the last one being the same genera as Boeck afterwards grouped together in his subfamily Iphimedinæ. In 1870 Boeck constituted the Dexamininæ the thirteenth subfamily of the Gammaridæ, to receive the genera *Dexamine* and *Lampra*, and at the same time made the Atylinæ the fourteenth subfamily, to receive the genera *Atylus*, *Pontogeneia*, *Halirages*, *Calliopius*, *Amphi-*

thopsis, *Cleippides*, and *Laothoës*. In his later work, 1872–1876, he retained these two subfamilies as respectively the sixth and seventh of the Gammaridæ, only changing the preoccupied name *Lampra* into *Tritæta*, and almost uniformly printing the name of the subfamily as Dexaminæ, even when referring to the earlier work in which it is Dexamininæ. In 1882 Sars established, though without defining, the family Atylidæ, placing in it the genera *Lampra*, *Dexamine*, *Atylus*, *Halirages*, *Calliopius*, *Amphithopsis*, *Laothoës*, no doubt omitting *Pontogeneia* and *Cleippides* only because they were not included in the fauna with which he was concerned.[1] If Boeck's definition of the Dexamininæ were correct, it would be proper to uphold that group as distinct, for he states that in it the mandibles are without palp, the first maxillæ have a one-jointed palp, and the maxillipeds are without the last joint of the palp, whereas in all these particulars the Atylinæ are normal. But of these three important characters of the Dexamininæ two seem not to be constant, since in *Tritæta kergueleni* at any rate the palp of the first maxillæ is apparently two-jointed, and in *Dexamine flindersi* the unguiform fourth joint is certainly present on the palp of the maxillipeds.

Genus *Halirages*, A. Boeck, 1870.

1870. *Halirages*, Boeck, Crust. amph. bor. et arct., p. 114.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 337.
1876. „ Sars, Prodromus descriptionis Crust. et Pycn., p. 357.
1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 117.
1880. *Pherusa*, Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 36.
1882. *Halirages*, Sars, Oversigt af Norges Crust., p. 102.
1884. „ J. S. Schneider, Crust. og Pycn. Kvænangsfjorden, p. 102.
1885. *Pherusa* (*pars*), Carus, Prodromus Faunæ Mediterraneæ, Pars ii. p. 404.
1885. *Halirages*, Sars, Den norske Nordhavs-Exp., p. 172.
1886. *Atylus*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 507.

For the original definition of the genus see Note on Boeck, 1870 (p. 401).

Boeck, it will be observed, says that "the mandibles have the palp elongate, the third joint shorter than the second," yet in describing *Halirages fulvocinctus*, M. Sars, he rightly says that the palp's third joint is a little longer than the second; the statement in the definition, that the back is not carinate, is not essential, and would not suit the species now to be included; the statement that the upper antennæ are shorter than the lower may be less rigidly expressed by saying that they are not longer; Boeck's further statement that the third uropods have a peduncle longer than the telson is not in agreement with *Halirages huxleyanus*, but neither is it with *Halirages inermis*, Sars, nor apparently with *Halirages tridentatus*, Bruzelius, if I rightly understand Boeck's own remark upon the proportions in that species; it should therefore be omitted from

[1] Oversigt af Norges Crustaceer.

the definition; finally, of the telson it may be said that it is whole or emarginate, the latter epithet applying to *Halirages fulvocinctus*, M. Sars, and *Halirages huxleyanus*, Sp. Bate.

Halirages fulvocinctus (M. Sars).

1859. *Amphithoë fulvocincta*, M. Sars, Oversigt over norsk-arkt. Krebsdyr, p. 22 (141).
1862. „ „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 381.
1863. *Pherusa tricuspis*, Stimpson, Proc. Acad. Nat. Sci. Philad., p. 138.
1865. *Paramphithoë fulvocincta*, Goës, Crust. amph. maris Spetsb., p. 9, fig. 15.
1870. *Halirages fulvocinctus*, Boeck, Crust. amph. bor. et arct., p. 116.
1876. „ „ Boeck, De Skand. og Arkt. Amph., p. 342, pl. xxiii. fig. 11*f*.
1884. „ „ J. S. Schneider, Crust. og Pycn. Kvænangsfjorden, p. 102.

Upper Antennæ.—The second and third joints of the peduncle crowded with small calceoli on the under side; the third joint distally produced below in a thin laminar process with serrate edges, about which calceoli and small spines are attached; the very numerous joints of the flagellum, so far as observed, were all armed with a calceolus apiece and some cylinders, the projecting distal points to which these are attached not being in line, give the flagellum a strongly serrate appearance on the under side.

Lower Antennæ.—The first three joints are short, with short spines on the upper margin; the fourth and fifth joints subequal, slightly curved, the upper margin convex, serrate, carrying many calceoli; the joints of the flagellum very numerous, armed with calceoli, the first joint long but showing rings as of many short joints in preparation, the joints immediately following the first much broader than long.

First Maxillæ.—Inner plate between oblong and oval, with five very unequal, strongly plumose setæ on the slightly oblique apical margin, the setæ graduated in size, the largest innermost; the outer plate on the broad apical margin carrying eleven spines of various lengths with teeth of various sizes, varying in number from two to six; the long second joint of the palp strongly ciliated, having a row of setiform spines passing from the distal part of the inner margin towards the outer apex, the distal margin strongly denticulate and set with spines or spine-teeth. Boeck assigns *six* setæ to the inner plate and *ten* spines to the outer, of which half are pectinate (kamdannet), the other half serrate (saugtakket); Schneider says, "I have only seen *eight* short spines, which are all pectinate (alle har kamtænder), on the outer plate, while the inner plate only has *five* plumose setæ on the apex."

Second Maxillæ long and rather narrow, the inner plate a little shorter than the outer, with four plumose setæ on the inner margin graduated in size, the lowest the longest; the apical margin fringed with spines shorter than these setæ; the apical margin of the outer plates fringed with feathered spines longer than the spines on the inner plate. Schneider says, "The inner plate has below on the inner rim *three* thick plumose setæ, the outer has only simple fine setæ."

Maxillipeds.—The outer plate has a smooth inner margin, the spine-teeth being set back at a little distance, although distally projecting beyond it; the palp's short finger has several setules on the inner margin near the base of the very acute nail, which is nearly as long as the basal part of the joint. In general these organs agree well with the description given by Boeck.

Gnathopods.—To the figures of these given by Goës Schneider objects that the lower hinder angle of the third joint is represented as rounded, "whereas in reality it is very sharply right-angled," but in the Challenger specimen, though this angle is scarcely to be called rounded, neither is it to be called sharply right-angled. One of the second pair of gnathopods in this specimen has the hand and finger so abnormal that had the other member of the pair been wanting this accident might have led to the institution of a new species.

Pleopods.—The cleft spines are very strong; the series numbers seven in the first pair, six in the second, five in the third.

The Telson is rather deeply concave or boat-shaped above, apically a little emarginate as well as serrate.

Length.—The larger specimen measured, from the front of the head to the end of the third pleon-segment, half an inch, and from the end of the third pleon-segment to the extremity of the uropods, a quarter of an inch, this part of the pleon being bent at right angles to the rest of the body in the specimen measured.

Locality.—Station 49, south of Halifax, Nova Scotia, May 20, 1873; lat. 43° 3′ N., long. 63° 39′ W.; depth, 85 fathoms; bottom, gravel, stones; bottom temperature, 35°. Two specimens, females.

Halirages huxleyanus (Sp. Bate) (Pl. LXXIII.).

1862. *Atylus Huxleyanus*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 135, pl. xxv. fig. 4.
1870. „ *? Batei ?*, Cunningham, Trans. Linn. Soc. Lond., vol. xxvii. p. 498.
1870. „ *Huxleyanus*, Cunningham, Trans. Linn. Soc. Lond., vol. xxvii. p. 498.

A short acute rostrum; head and peræon as far as the sixth segment dorsally rounded; back of peræon with an imbricated appearance, postero-lateral angles of the three last segments acutely produced backwards; the sixth and seventh segments of the peræon and first three of the pleon produced backwards dorsally in large pointed processes, that on the second pleon-segment being the longest; the three first segments of the pleon dorsally carinate, with their postero-lateral angles produced in short sharp points. There are markings on the integument, described by Mr. Spence Bate as "somewhat resembling the representation of a flying bird."

Eyes round, of moderate size, dark coloured in the specimen preserved in spirits, the numerous ocelli long, so as to present a broad outer ring, uncoloured.

Upper Antennæ.—The joints of the peduncle successively decreasing in length and thickness, the first about twice as long as broad; the flagellum three or four times as long as the peduncle, rather thick near the base, the joints numbering sixty-two, none very long, most of them widening a little distally, and some widening much, namely the first, third, sixth, ninth, eleventh, thirteenth, eighteenth, twenty-fourth, twenty-ninth, thirty-fifth, fortieth, forty-fourth; these carry cylinders, in groups of three or four, about as long as two succeeding joints; all the joints, except perhaps the last two, carry small calceoli, many of the upper ones having the lower margin fringed with four or more; some are found at the apex of the first joint of the peduncle, and there is a row along the distal half of the lower margin of the second and third joints.

Lower Antennæ.—The peduncles a little longer than in the upper antennæ, the flagella of about the same length; the first joint not much inflated, the gland-cone minute, not prominent; the distal rim of the coalesced first and second joints a little crenulate, with a few setæ or slender spines; the third joint more than half the length of the fourth, which is rather longer than the fifth; all three have spines on the lower margin and at the apex of the upper; the flagellum of fifty-six joints, evenly tapering, armed as in the upper antennæ with small calceoli, some of the upper joints having as many as six, and the third, fourth, and fifth joints of the peduncle having two or three rows of them along the under (or perhaps the inner) side.

Upper Lip not well made out, but apparently membranous in texture, with the rounded distal margin strongly ciliated and slightly projecting at the centre. These characters, however, must not be regarded as very definitely ascertained.

Mandibles.—The cutting-plate narrow, with its edge divided into seven teeth, none of them very large; the secondary plate on the left mandible similar to the principal one, which to a certain extent clasps it, but smaller, its edge divided into five teeth; on the right mandible this plate is as usual of slighter construction, it is curved, divided apically into two slender teeth, and has a denticle on the outer convex margin; the spine-row of seven slender, denticulate, more or less curved spines; the molar tubercle prominent, the oval crown set with numerous rows of denticles; a blunt-headed process adjoins the base of the palp, just over the molar tubercle; the first joint of the palp is short, the second is broader than either the first or third, a little longer than the third, concave behind, widening distally, with some small spines at intervals on the front margin, and on the outer surface a couple about one-third of the length from the base, and (commencing at about the centre of the same surface) a curved row of sixteen, slightly curved, pectinate spines, graduated in size, those in the middle of the row being the longest; the third joint has its concave front margin crowded with pectinate spines of various lengths, and two or three long ones close to the base of the hind margin.

Lower Lip.—The principal lobes much ciliated, somewhat dehiscent, distally

broad, but much broader at the base; the inner plates seemingly adnate, their inner margins marked by a line of backward-pointing cilia; the mandibular processes small, with rounded apices.

First Maxillæ.—Inner plate small, with five plumose setæ at and near the apex; outer plate broad, with eleven slender denticulate spines on the truncate distal border, the lateral denticles numbering from two to six, all except the outermost of the shorter spines having at least four; the palp broad, its long second joint reaching beyond the outer plate, the truncate margin fringed in one of the maxillæ with five short teeth and a spine, in the other maxilla with six spine-teeth and a spine; in both there are four spine-like setæ rising on the surface just within the distal margin.

Second Maxillæ.—Inner plate a little broader and shorter than the outer, the spines running round the apex and about halfway down the inner margin, at which point are five plumose setæ, the lowest small, the two uppermost large and long; the spines of the outer plate, which are as usual longer than those of the inner, do not descend the inner margin.

Maxillipeds.—The prismatic inner plates rather long, but not nearly reaching as far as the distal end of the first joint of the palp, with several plumose setæ on the inner margin, which pass round towards the outer apex, at that part being short and incurved; the truncate distal margin has three small teeth; the outer plates not reaching far beyond the first joint of the palp; the inner margin smooth, but the surface at a little distance within it set closely with longer and shorter spine-like setæ, which are continued round the apical margin, being there setiform and plumose; the outermost but one is the longest, the outermost being abruptly much shorter; the first joint of the palp is longer than the third; the second longer than either, very broad, its length not twice its own breadth, fringed on the inner margin with numerous setæ, of which it has groups about the distal margin and on the outer surface near the inner margin; the third joint bending inwards, with numerous groups of setæ or spines on the inner surface and round the finger; the finger shorter than the third joint, its inner margin nearly straight, armed with a row of five setules; the nail a little curved, almost spine-like.

First Gnathopods.—Front margin of side-plate short, convex; lower margin a little concave, carrying some microscopic spinules, forming a rounded angle with the hinder margin, the whole plate very small. First joint of the limb reaching much beyond the side-plate, front margin almost straight, with a small lobe of the outer surface within its distal angle, the hind margin bent above the centre, and at the bend carrying a group of four long setæ, and another group on the inner surface near these; second joint short, like the preceding distally fringed on the lower inner margin at the back with spines of various lengths; third joint almost triangular, hind margin irregular, inner surface with four groups of spines, the largest near the acute apex; the wrist nearly as long as the first joint, widening distally, fringed with groups of spines round the serrate hind margin,

and carrying other groups on the inner surface; the hand oval, narrowest at the finger hinge, longer than the wrist and wider, the front margin with some small spines beyond the centre, and longer ones at the apex, the hind margin for the first quarter smooth, the second serrate, the remainder smooth and thin; after the first quarter it is set all the way along with setæ, setules, or setiform spines, the inner surface shows six groups of spines near the hind margin, and four near the front, the most distal of these four having spines of great length; at the fourth serrature of the hind margin begin groups of stout spines of many different lengths, with short accessory threads, and accompanied by groups of setæ on the outer surface; the spine-groups, about four in number, may be considered as defining the palm, but the curved, rather stout finger is not long enough to reach the lowest group; the inner margin of the finger has some stiff short hairs or spinules, and some spinules can be perceived on or near its outer margin; the nail has two cilia at the base; the dorsal cilium of the finger is very short, near the hinge.

Second Gnathopods.—Side-plates a little larger than those of the preceding segment, produced below to a backward-directed angle. The branchial vesicles much longer than the first joint of the limb, broadest near the centre, rather more than twice as long as the greatest breadth. The limb presents a very close resemblance to that of the first gnathopods. The first joint is a little longer and not quite so broad, and is without the group of long setæ on the inner surface; the second joint has an apical group of spines on the hind margin, but not a small intermediate group which is found in the first gnathopods; the hand also appears to have rather fewer groups of spines on its inner surface.

First Peræopods.—Side-plates produced backwards below in a rounded point, above which there is a small prominence. The branchial vesicles widening out below, retaining much of their breadth distally, not reaching the distal end of the first joint. The first joint reaching beyond the side-plate, in shape and armature as in the second gnathopods, but longer and broader; the second joint short; the third narrow at the base, then widening, in length subequal to the fourth joint, a little decurrent in front, with spines at two points on each margin; the fourth joint widest distally, with spines at the apex in front and behind, and also at one point high up on the hind margin; the fifth joint not much shorter than the two preceding joints united, with spines at four points of the hind margin, at the apex in front, and at one point a little way above it; the finger short, stout, strongly curved, with two cilia near the base of the nail, and a short dorsal cilium near the hinge.

Second Peræopods.—Side-plates a little broader at the base than in the preceding segment, otherwise similar. The limb scarcely distinguishable from that of the preceding pair; an extra spinule may be noticed on the hind margin of the fourth joint, another on that of the fifth, and an extra group of small spines on the front margin of the fifth joint. These limbs do not seem to differ in length.

Third Peræopods.—Side-plates broader than in the preceding segment, produced below in two rather long lobes, the lower ends of which are wide apart. The first joint broader above than below, with spines at four points on the nearly straight front margin, the hinder with only some minute spinules; the lower part of the joint squared on the outer side, while the inner surface is pear-shaped; the rest of the limb resembles the preceding peræopod, but is a little larger, and the fourth joint has three groups of spines on the front margin, that is, the margin corresponding to the hind margin in the preceding limb.

Fourth Peræopods.—Side-plates with a long lobe decurrent behind. The branchial vesicles with an accessory pouch at the upper part. The first joint similar to that of the third peræopods, but considerably larger, especially in breadth; the rest of the limb similar to the preceding, but the third and fourth joints considerably longer, and each with spines at a point in the hind margin; the fifth joint also rather longer.

Fifth Peræopods.—Side-plates small, not decurrent. The first joint longer and broader than in the preceding peræopods, rather more pear-shaped, although distally broad; the rest of the limb similar to the preceding, but all the joints longer.

Pleopods.—Coupling spines very small; cleft spines five in the first and second pairs, four in the third pair, the branches of the cleft short and equal; the joints of the rami number from eighteen to twenty-two.

Uropods.—The peduncles of the first pair longer than the rami, reaching just beyond those of the second pair, but not so far as those of the third, with three or four spinules on the inner margin, the outer clear; the rami slender, the outer shorter than the inner, each tipped with a large nail-like spine, having a small one by its side, the inner ramus also carrying four or five small spines on its margin; the peduncles of the second pair shorter than the inner ramus; the outer ramus much shorter and narrower than the inner, each tipped as in the first pair, the inner also having two spines on the outer and five or six on the inner margin; the inner reaches back about as far as the inner of the first pair, the outer not so far as the outer of that pair; peduncles of the third pair shorter than the rami, which are broad, lanceolate, subequal, the outer rather the longer, both reaching a little further back than those of the other pairs; the inner ramus has its inner margin fringed with thirteen spines with plumose setæ of different lengths; on the serrate lower portion of the more convex outer margin there are six spines with setæ; the outer ramus has six or seven spines on its inner margin, and two or three on the lower part, besides spinules on the upper part, of the outer margin.

Telson reaching beyond the peduncles of the third uropods, elongate, with the lateral margins very slightly sinuous, on the whole tapering to a narrow emarginate termination.

Length.—The specimen, in the position figured, measured half an inch from the rostrum to the apex of the dorsal process on the second pleon-segment.

Locality.—The single specimen was labelled as taken "from the kelp in Stanley Harbour, Falklands, Jan. 1876."

Remarks.—This appears to be the same species as that named *Atylus huxleyanus* by Spence Bate, which was brought from Hermit Island by the Antarctic expedition. Hermit Island is in lat. 55° 51′ 20″ S., long. 67° 32′ 10″ W.; Stanley Harbour in lat. 51° 40′ S., long. 57° 35′ W.

The species is separated from the genus *Atylus* by the robust mandibular palp, by the maxillipeds, of which the outer plate is not dentate, and the palp broad instead of narrow, by the fifth and sixth segments of the pleon, which are distinct, not coalesced, and by the telson, which is not divided, but very slightly emarginate. Its nearest ally seems to be *Halirages tridentatus*, Bruzelius.

Genus *Atylus*, Leach, 1815.

1815. *Atylus*, Leach, The Zoological Miscellany, vol. ii. p. 21.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii. p. 357.
1816. „ Leach, Annulosa, Encycl. Brit. Suppl., p. 425.
1816. *Atyle*, Latreille, Nouveau Dict., vol. i.
1825. „ Desmarest, Consid. gén sur la classe des Crust., p. 262.
1830. *Atylus*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 383 (32).
1840. „ Lucas, Hist. Nat. des Crust. Arachn. et des Myriap., p. 231.
1840. „ Milne-Edwards, Hist. des Crust., tom. iii. p. 67.
1851. *Amphithonotus* (*pars*), Costa, in Hope's Catal. Crost. Ital., pp. 40, 46.
1852. *Iphimedia* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 910, 926.
1852. *Atylus*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 912.
1853. *Notrotopis*, Costa, Rend. della Soc. r. Borb.
1857. *Nototropis*, Costa, Ricerche sui Crost. Amf. Nap., pp. 175, 193.
1860. *Epidesura*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 659.
1862. *Atylus*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 133.
1862. „ Bate and Westwood, Brit. Sess. Crust., p. 244.
1865. *Paramphithoë* (*pars*), Goës, Crust. amph. maris Spetsb., p. 7.
1865. *Atylus*, Lilljeborg, On the Lysianassa magellanica, p. 18.
1866. „ Heller, Amph. der Adriatischen Meeres, p. 31.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 280.
1870. „ Boeck, Crust. amph. bor. et arct., p. 109.
1871. „ Metzger, Die wirbellosen Meeresthiere der ostfriesischen Küste.
1874. „ Buchholz, Die zweite deutsche Nordpolarf., p. 357.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 322.
1878. „ Spence Bate, Crust. in Couch's Cornish Fauna revised and added to, p. 51.
1878. „ G. M. Thomson, Trans. New Zealand Inst., vol. xi. p. 238.
1879. „ Hoek, Carcinologisches, p. 134.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 101.
1882. „ Haswell, Catal. Australian Crust., p. 242.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, p. 403.
1885. „ Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. p. 7 (sep. copy).
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 507.

For the original definition of the genus, see Note on Leach, 1815 (p. 89). Boeck defines it as follows :—

"*Mandibles* with the palp weak and slender; the length of the second joint surpassing that of the third.[1]

"*First Maxillæ* with the inner plate of moderate length, furnished with from seven to eight plumose setæ.

"*Second Maxillæ* elongate, narrow.

"*Maxillipeds* having the outer plate armed on the inner margin with many strong teeth, which as they approach the apex are elongate, curved, and finally become setiform; the inner plate elongate, strong; the palp short and narrow; the outer plate extending beyond the second joint of the palp.

"The body compressed; the back carinate; the keel on several segments forming backward-directed teeth; the head with a long curved rostrum, compressed or subdepressed; the side-plates not very deep, sometimes rigid, plumose on the lower margin, the last two segments of the pleon coalesced.

"*Lower Antennæ* longer than the upper.

"*First* and *Second Gnathopods* with the hand small.

"*Second Uropods* shorter than the *third*.

"*Third Uropods* with the peduncle shorter than the telson; the rami equal.

"*Telson* cleft."

Atylus homochir, Haswell (Pl. LXXIV.).

1885. *Atylus homochir*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. p. 7 (sep. copy), pl. xiii. figs. 5–7.

A sharp slender rostrum projecting a little beyond the triangular lateral lobes of the head, below which its lower angles are acutely produced; the whole of the back sharply carinate, the carina continuous from the tip of the rostrum to the end of the third pleon-segment, except that the seventh peræon-segment and the first three segments of the pleon are distally produced in minute teeth; the carina of the fourth pleon-segment forms two teeth, the hinder one the larger; the hinder part of the dorsally coalesced fifth and sixth segments is also produced into a large tooth, with a spine-tooth on the centre of its dorsal line, and separated by a small depression from that narrow front part of the segment which carries the second uropods; the postero-lateral angles of the first three segments of the pleon produced into small points, above each of which is placed a spine, but the lower convex lobe of the hind margin in each segment swells out beyond the lower angle; many submarginal spines on the lower margins of these segments. The integument with a scale-covered appearance.

Eyes oval or reniform, retaining colour in spirits, situate near the convex margin of the head between the rostrum and the lateral lobes, ocelli numerous, rather elongate.

Upper Antennæ.—Peduncles carinate, first joint long, about twice the length of the

[1] Not so in all species, *e.g.*, *Atylus homochir* and *Atylus swammerdamii*.

rostrum, distally produced into a short tooth below; second joint thinner, a little longer; third joint about one-fourth the length of the second, distally a little widened, and showing a little tubercle which seems to be the rudiment of a secondary flagellum; the principal flagellum of forty joints, which widen a little distally, and are furnished with short setules, and almost every one with a cylinder shorter than the joint.

Lower Antennæ.—First three joints very short, the first with a small produced point below, the second distally angled below the gland-cone, the third equal in length to the first two united; the fourth much longer than the first three united, longer than the second joint of the upper antennæ; the fifth joint longer than the fourth, like it carinate and carrying numerous groups of slender spines; flagellum of thirty-five joints, not distally dilated, but besides having two or three groups of setules, carrying either successively or alternately (the last six excepted) a short stout spine with a bent tip.

Upper Lip with the apex furred, not very broadly rounded.

Mandibles.—Cutting plate divided into three or four small, followed by three large teeth; those represented in the Plate are worn and rounded; the new teeth as seen in preparation for the change of skin are much more sharp and distinct; the secondary plate on the left mandible divided into four teeth, of which the lowest is the most prominent; the secondary plate on the right mandible is bifid, each division showing a slender apical tooth, attended by three denticles; the spine-row of seven denticulate spines; the molar tubercle moderately prominent, with a large crown occupied by many rows of denticles, the plumose seta conspicuous; the slender palp set just over the molar tubercle, its first joint distally dilated, the second straight or nearly so, with four or five small setæ or spines on the inner margin, the third joint longer than the second, with the hind margin slightly convex, carrying at the top of the oblique apex a pectinate spine longer than the joint, two others shorter, and two more much shorter, and on the inner margin two small spines, one at the centre, the other near the apex.

Lower Lip.—Principal lobes broad, very slightly dehiscent; mandibular processes narrow, divergent.

First Maxillæ.—Inner plate small, oval, with six plumose setæ on the distal margin; the outer plate with eleven variously denticulate spines on the truncate margin, the denticulation near the apex, the two innermost spines shorter than the rest; of these eleven nine only are shown in the enlargement of fig. *mx.*1.; first joint of the palp with a spine on the outer margin, the second joint reaching much beyond the outer plate, dilated distally, carrying on the distal margin six or seven pectinate spine-teeth, shorter on one maxilla than the other, in accordance with Boeck's character for the subfamily Atylinæ, that the palp of the first maxillæ is two-jointed, *in apice maxillæ sinistræ dentibus, in apice maxillæ dextræ spinis armato*; there are also some slender submarginal spines. On the outer margin of the trunk below the palp some unequal slender spines are present.

Second Maxillæ.—The inner plate a little shorter and considerably narrower than the outer, the spines numerous and strong round the apical margin, descending the inner margin a little way, where the series ends with some densely plumose setæ, the largest lowest, the outer plate also with numerous and strong spines round the apical margin, extending a little way down the front and hinder margins.

Maxillipeds.—Inner plates rather short and broad, reaching beyond the short first joint of the palp, with five plumose setæ along the inner margin, and three stout spine-teeth on the slightly convex distal border, which is fringed with about a dozen sub-marginal curved plumose spines; outer plates long and rather narrow, reaching about to the end of the narrow second joint of the palp, inner and apical margins fringed with spine-teeth, passing gradually into long curved spines; in the specimen examined there were ten of the former on the inner, four of the latter on the apical, margin; second joint of the palp more than twice the length of the first, with many groups of slender spines about the inner margin; third joint much longer than the first, a little shorter than the second, with many groups of spines about the inner margin, and one group at the centre of the hind margin, which is not as usual evenly convex; there are also many spines about the apex, which is produced on the outer side; the finger small and weak, with a spine-like nail, a dorsal cilium not far from the base of the nail, and on the inner margin several setules near and at the base of the nail, those at its base being the longest.

First Gnathopods.—The side-plates narrower below than above, the front margin bent a little forwards, the corner rounded and crenulate, with spinules in the interstices, the lower part of the hind margin also carrying spines. The first joint extending much beyond the side-plate, expanding distally, the front margin almost straight, with numerous setiform spines, the hind margin more convex, armed with setæ and spinules, and on the outer surface carrying six or seven groups of curved spines, and an apical group of about twelve accompanied by long setiform spines; the short second joint has three groups at the hind margin, followed by an apical group or row of some twenty-four graduated spines, together with some long and slender ones; the third joint has scarcely any free front margin, some eight groups of spines on the hinder margin, those towards the apex being long and pectinate; the wrist is long, triangular, with five groups of spines on the front and four on the hind margin, the latter having near them rows on the inner surface; the hand is equal in length to the wrist, with an oblique palm, bordered with many spinules, and defined by several stout palmar spines among which the finger closes; besides these there are three other groups of spines on the hind margin, with attendant groups on both surfaces, but the most conspicuous ornamentation of the hand is on the inner surface (that shown in the Plate) along the front margin; here there are seven groups or rows of spines, the number in a row gradually increasing from three near the base to twenty-seven near the finger; distally the long spines of the hand and wrist are very finely

pectinate, more coarsely near the middle, at which part it is easily seen that the pectination is on two edges; the inner margin of the finger is produced into a tooth at the base of the nail; the dorsal cilium near the base of the finger is small.

Second Gnathopods.—Side-plates with the front margin convex, its lower portion serrate and spined, its lower angle rounded and crenulate as in the preceding pair. The branchial vesicles oval, broadest below, reaching much beyond the side-plates; in the specimen examined one of the pair was distally bilobed. Marsupial plates long and rather broad, longer than the branchial vesicles, the edges finely crenate for the long setæ. The limb like that of the first gnathopods, but all the joints longer, especially the hand and wrist; the armature similar, except that the hand is more simply adorned.

First Peræopods.—Side-plates broad, the front corner and much of the lower margin crenate and spined. The branchial vesicles long and broad. The marsupial plates long, not broad except near the middle. First joint, as in the preceding and the following pair, having its base close to the lower border of the side-plate, long, and nearly evenly broad, with many spines on both margins, those near the base very slender, some very long ones on the hinder margin, also with several submarginal groups on the surface near it; the short second joint has spines at three points of the hind margin, some of which, as in the preceding joint, are long and plumose.

Second Peræopods.—Side-plates very similar to the preceding pair, a little broader, the hind corner a little drawn down, as in the preceding pair with numerous spines on the lower part of front and hind margins, only a small part of the lower margin being without spines or crenulation; there are also many setæ on the inner surface of the plate in this and the three preceding pairs; the branchial vesicles large. The marsupial plates long and slender. Limbs like those of the first pair but a little shorter; the third joint longer than the next two united, with six groups of spines at the hind margin, and three on the front; the fourth joint much shorter than the fifth, like the fourth somewhat dilated distally, with two groups of spines on the hind margin, the front smooth except at the apex; the fifth joint with four groups of stout spines on the hind margin, the front slightly convex, smooth except at the apex; the finger strong, curved, longer than the fourth, shorter than the fifth joint, with two setules at the base of the strong curved nail; a small dorsal cilium near the base of the finger. In the Plate the last four joints are drawn facing the wrong way.

Third Peræopods.—Side-plates with the front lobe much narrower and deeper than the hind one, of which the lower margin is sinuous; both have the lower portion set about with spines. First joint pear-shaped, broader above than below, the hind margin fringed with curved spines, the expanded part serrate, the front margin with numerous groups of slender setæ or setiform spines, the lower margin squared, neither lobed nor decurrent; the second joint short; the third shorter than the first, longer than the fourth, not expanded, sparingly spined; the fourth longer than the fifth, with spines at three

points on each margin; the fifth a little curved, with spines at four points on each margin; the nail as in the preceding pair, but rather smaller.

Fourth Peræopods.—The side-plates in shape much like those of the preceding segment, but with the front margin straight instead of convex, and fringed with setiform spines, while the lower margin behind is strongly spined. The first joint is longer and broader than in the preceding pair, of even breadth for some way down, the convex front margin carrying numerous setiform spines on the upper part, stronger groups of spines on the serrate lower part, the hind margin serrate, fringed with many slightly plumose spines, the upper ones curved; the short second joint with two or three groups of small spines in front; the long third joint with spines at eight points of the front, and four of the hind margin; the fourth joint long and slender, shorter than the third, but longer than the fifth.

Fifth Peræopods.—Side-plates deeper behind than in front, armed like the preceding pair. The first joint shorter but broader than that of the fourth peræopods, the armature similar, the front margin nearly straight, the hinder evenly convex; the second joint short; the third shorter than in the preceding pair, with four groups of spines on the front margin besides one or two spinules, three groups and a spinule on the hind margin, which is scarcely decurrent, with the apex squared; the fourth joint longer than the third, and considerably longer than the fifth, with four groups of spines on each margin; the fifth joint with five groups of spines on the front, and four on the hind margin; the finger as in the other peræopods; this and the hand are twisted away from their normal position in the Plate.

Pleopods.—Coupling spines very small; a sharply produced interlocking process connects the peduncle and the first joint of the outer ramus; cleft spines seven in number on the first pair, six in the following pairs, the arms very short, and the outer but little longer than the inner; in the specimen examined the number of joints of the inner ramus of the third pair was twenty-one.

Uropods.—Peduncles of the first pair a little longer than the rami, the inner ramus a little longer than the outer, both with numerous marginal spines; the peduncles of the second pair longer than the outer ramus, shorter than the inner; the rami, like those of the first pair, tipped with spines and having many spines on the margins; neither the peduncles nor the rami reach back so far as those of the other two pairs; peduncles of the third pair short; the rami long, broadly lanceolate, bordered and tipped with spines, subequal, the outer broader and a little the longer, reaching back as far or nearly as far as the rami of the first pair.

Telson short,[1] longer than the breadth at the base, cleft for three-quarters of its length, little dehiscent, the slightly sinuous outer margins converging to the tolerably broad distal margin, each half of which carries a spine and is produced to a small point on the inner side. There are some cilia on the surface.

[1] Contrary to the generic character, not longer than the peduncles of the third uropods.

Length.—The specimen, in the position figured, from the front of the head to the back of the third pleon-segment, measured half an inch.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. Several specimens; the one examined was a female.

Remarks.—The relationship of this species to *Atylus vedlomensis*, Bate and Westwood, is striking and close, and that species is itself not far removed from *Atylus swammerdamii*, Milne-Edwards, with which Mr. Haswell compares this. When figuring it, now some years ago, I had named the species *Atylus acutus*, but upon comparison with Mr. Haswell's account of *Atylus homochir*, I have thought it better to accept his name for the species, since the differences in his account and figures may be probably attributed to the smallness of the specimen he examined.

Genus *Atyloides*, n. gen.

Mandibles with palp well developed, the third joint as long as the second, or nearly so.

First Maxillæ with many plumose setæ on the inner plate.

Second Maxillæ with the plates elongate, many plumose setæ on the side of the inner plate.

Maxillipeds as in *Atylus*, except that the outer plate does not reach the apex of the second joint of the palp.

Body not carinate or dentate; the fifth and sixth segments of the pleon separate, not coalesced.

Upper Antennæ with a one-jointed accessory flagellum.

In other respects like *Atylus*.

The generic name refers to the likeness between this genus and *Atylus*.

From *Pontogeneia*, Boeck, the new genus is distinguished by the palp of the mandibles, by the spine-teeth (not slender spines) on the inner margin of the outer plate of the maxillipeds, by the antennæ, of which the upper are not longer than the lower, and have an accessory appendage which appears to be wanting in *Pontogeneia*. From *Amphithopsis*, Boeck, which is a synonym of *Pherusa*, Leach, it is distinguished in like manner by the antennæ, by the numerous setæ on the inner margin of the inner plate both in the first and the second maxillæ, and by the cleft telson. The name *Paramæra*, Miers, was given under a misapprehension of the characters of the species for which the genus was instituted, and being suggestive of an affinity which does not really exist, is scientifically unsuitable. It was upon fuller knowledge withdrawn by Mr. Miers himself, and cannot, I think, be conveniently revived; see Note on Miers, 1875 (p. 447).

Atyloides australis (Miers) (Pls. LXXV., LXXVI.).

1875. *Paramœra australis*, Miers, Ann. and Mag. Nat. Hist., ser. 4, vol. xvi. p. 75.
1875. *Atylus australis*, Miers, Ann. and Mag. Nat. Hist., ser. 4, vol. xvi. p. 117.
1876. „ „ S. I. Smith, Bull. U.S. Nat. Mus., vol. iii. p. 61.
1879. „ „ Miers, Zool. of Kerguelen Island, Trans. Venus Exped., Zool., p. 9, pl. xi.
1879. „ „ Studer, Arch. f. Naturgesch., Jahrg. xliv. Bd. i. p. 126.
1880 1. „ *megalophthalmus*, Haswell, Linn. Soc. N.S.W., vol. v. p. 102, pl. vi. fig. 4.
1882. „ „ Haswell, Catalogue of the Australian Crustacea, p. 244.

Rostrum minute; animal rather compressed; postero-lateral angles of the third pleon-segment rounded, the lower part of the hind margin a little serrate, the lower border of this and the preceding segment having several submarginal spines.

Eyes close to the little-developed lateral lobes of the head, rather large, reniform, dark in the specimens preserved in spirits. A few of the ocelli, as seen from the inner side, are figured on Pl. LXXV., fig. *oc.*

Upper Antennæ not long, the peduncle shorter than the flagellum, the first joint in large specimens twice as long as broad, equal in length to the next two united, in small specimens longer than broad, longer than the next two united; the third joint about half the length of the second, all three with groups of setæ on the lower side, which in the larger specimens is rough with short spiny or scaly hairs; flagellum in a large specimen of fifty-five joints, in a small specimen of twenty-one joints, tapering, the earlier joints broader than long, every other widening at the lower apex, and there armed with a group of setæ, and in large specimens two or three cylinders; the accessory flagellum consists of a single tapering or triangular joint, shorter than the first of the principal flagellum, tipped with a long seta and a shorter one.

Lower Antennæ subequal in length to the upper, the peduncle longer than that of the upper antennæ, the first joint a little expanded, the gland-cone decurrent along the side of the short third joint; the fourth joint about as long as the three preceding united, subequal in length to the fourth, but broader; the gland-cone carrying three or four setæ, the third, fourth, and fifth joints furnished with several groups of them; the flagellum of fifty-six joints in a large specimen, of twenty-four in a small specimen, the first joint longer than any of the following.

Upper Lip with the distal margin rounded, closely ciliated.

Mandibles.—The cutting plate with its edge divided into seven or eight teeth, of which the outermost but one is the largest; the secondary plate on the left mandible is similar to the principal, on a smaller scale; on the right mandible it is slender, ending in three or four teeth, of which one is more prominent than the others but very slender; the spine-row of nine or ten slender curved spines, showing serration on the convex margin; the molar tubercle broad and massive, the crown set with many denticles, the

external pointed tooth-like, the internal appearing like concentrically sinuous serrate blades; there is a small process between the molar tubercle and the base of the palp; the palp is set just over the molar tubercle, its second and third joints subequal in length, the second with the outer margin more or less concave, and with many spines along the front margin, those near the distal end long; the third joint having from five to seven on the outer surface near the base, and on the front margin an even row of close-set spines attended by others longer and more widely spaced, and at and near the apex six that are long; all or nearly all these spines are pectinate, the three terminal more finely than the three below them.

Lower Lip.—The principal lobes strongly ciliated on the inner part of the distal margin, lightly also on its outer part, little dehiscent; the mandibular lobes short, squared at the ends.

First Maxillæ.—Inner plates small, with thirteen (in small specimens seven or eight to ten) plumose setæ on the inner or oblique distal margin, those nearest the actual apex the longest, thickest, and most coarsely plumose; outer plate with eleven strong spines on the obliquely truncate distal margins, some of the spines denticulate for much of the length below the apex, others more strongly denticulate close about the apex; the second joint of the palp reaching beyond the outer plate, carrying on its distal margin seven to twelve short spines or spine-teeth, with several setæ or plumose spines adjoining, and three setæ on the outer margin.

Second Maxillæ.—The plates elongate, the inner a little narrower but scarcely shorter than the outer, carrying on its surface a row of fourteen to seventeen plumose setæ, the row beginning low down on the inner margin; the distal margins of both plates carrying numerous spines, those of the outer as usual the longer; these are curved and finely pectinate; a few short spines descend the outer margin of the outer, and the inner of the inner plate.

Maxillipeds.—The inner plates comparatively large, yet scarcely reaching as far as the distal end of the first joint of the palp, carrying several plumose setæ on the inner margin, and smaller incurving plumose setæ or spines on the distal, and distal part of the outer, margin; the truncate distal margin has three strong triangular teeth, and a fourth is inserted just below its inner apex on the outer surface; the outer plates not reaching the distal end of the second joint of the palp, having the inner margin bordered with eighteen rather long spine-teeth, succeeded round the distal margin and distal half of the outer, by eight or ten plumose setæ; there are also numerous groups of setæ on the outer surface in the neighbourhood of the inner margin for almost its whole length; this outer surface is figured on Pl. LXXV.; the first joint of the palp is short, with setæ on the inner margin and outer apex; the second joint broader and much longer, with numerous setæ in a row along the inner margin, in groups upon the surface and outer margin; the third joint longer than the first, with several groups of setæ upon the surface

and at the margins, and at the apex a graduated row of strongly pectinate spines; the finger short and broad, with a sharp nail having a cilium at its base; the inner margin of the finger smooth near the base, then set with eight setules; in the small specimens there are fewer spine-teeth on the outer plate, and fewer setules on the edge of the finger.

First Gnathopods.—Side-plates rounded below. First joint reaching much beyond the side-plate, the front margin straight, with small setæ, the hinder with some long and short setæ near the base and a group of spines at the apex, some of them pectinate; the second joint short, with spines at the apex behind; the third joint rhomboidal, with spines on the hinder and lower margins, the front margin apically produced; the wrist shorter than the hand in the young and female, very much shorter in the adult male, with numerous distally pectinate spines about the free portion of the hind margin, which is somewhat serrate; the hand in the adult male broader than the wrist, widest at the palm, with six groups of spines along the straight hind margin and several small groups on the inner surface; the palm convex, a little oblique, fringed with setules, a row of five or six broad spines of different lengths on the surface on either side of it; the curved finger when closed shows its tip just beyond the palm; it has some spinules or teeth on the inner edge and a small dorsal cilium not very far from the base.

Second Gnathopods.—Side-plates oblong, with rounded ends, deeper than the preceding pair. Branchial vesicles long and of great breadth, narrowing little distally. Marsupial plates very long and broad, narrowing distally, with many long setæ round the distal end and inner margin. The limb closely resembles that of the first gnathopods, but with the first, third, fourth, and fifth joints more elongated; the apical spines on the hind border of the first joint show the same pectination. Both the first and second gnathopods of the male specimen examined were beset with a parasitic zoophyte in great number; their appearance on the first joint of the first is figured Pl. LXXV. fig. *gn.*1. ♂. In both gnathopods the hand is very much narrower in the young and female than in the male.

First Peræopods.—Side-plates like the preceding pair but larger. Branchial vesicles with a narrow neck, then gradually expanding and again narrowing slightly, very long. Marsupial plates broad, even distally, longer than the branchial vesicles, with long setæ all round, sparsely on the outer side. First joint of the limb reaching beyond the side-plate, with short spines along the straight front margin, some long setæ on the hinder margin and groups of spines; a group of spines on the hinder apex of the second joint; several groups on both margins of the third joint, which is broader than the fourth or fifth, longer than the fourth, but subequal in length to the fifth, its front apex somewhat decurrent; the fourth and fifth joints have numerous groups of spines on the hinder margin, while the front margin is slightly armed; the finger is short, curved, with a small dorsal cilium near the base, and two cilia at the base of the nail.

Second Peræopods.—Side-plates much broader but very little deeper than the pre-

ceding pair, excavate behind but not far down. The limb and its appendages not materially different from the preceding pair.

Third Peræopods.—Side-plates broader than deep, the hind lobe deeper than the front one. Branchial vesicles much larger than the first joint. Marsupial plates small. First joint tending to oval in form, broader above than below, with setæ on the upper part of the front margin, succeeded by several groups of spines, the more convex hind margin very slightly serrate and scarcely armed; the second joint short, with two groups of spines in front, partly overlapped behind by the lower lobe of the first joint; the third joint like that of the preceding peræopods, but rather larger; the fourth and fifth joints likewise resembling those of the preceding pair, but being rather wider; the finger similar.

Fourth Peræopods.—Side-plates with a downward-produced hind lobe. Branchial vesicles broad but not descending quite to the lower end of the first joint, with an accessory pocket quite at the base. The limb resembling that of the preceding pair, but with the joints longer, except perhaps the second and the finger.

Fifth Peræopods.—Side-plates as usual small, deeper behind than in front. Branchial vesicles broad, but short, not reaching the middle of the first joint. The first joint broader and longer than in the preceding pair; the second and third joints similar, but the spines on the front margin of the third differently grouped.

Pleopods.—The peduncles produced on one side into an irregular tongue-like process beside the first joint of the outer ramus; the coupling spines slender, with three or four denticles; the cleft spines in the adult numbering six on the first pair, five on the third; in the young there appear to be but four on the third pair; the joints of the rami numbering fifteen or sixteen in the young, twenty-five or twenty-six in the adult.

Uropods.—Peduncles of the first pair longer than the rami; outer ramus shorter than the inner, both spined along the edges and tipped with spines; peduncles of the second pair shorter than the longer inner ramus; the rami armed as in the preceding pair, which they much resemble, carrying many more spines in the adult than in the young specimens; peduncles of the third pair much shorter than the rami, reaching back beyond those of the second, and just level with those of the first pair; the rami long, broad, lanceolate, acute, fringed on the margins with numerous spines and setæ, the outer scarcely shorter than the inner, reaching back just as far as the inner ramus of the first pair.

Telson much longer than the peduncles of the first uropods, cleft beyond the centre, tapering, not dehiscent, with a small emargination carrying a spine on the side just above each apex, or it may be said that each apex is emarginate, with the outer horn of the emargination shorter than the inner.

Length.—One of the specimens, in a very slightly curved position, measured three-fifths of an inch, exclusively of the antennæ; this was an adult female.

Locality.—The specimens were all obtained at Kerguelen Island, the larger from a depth of 25 fathoms, the small ones, which were numerous, from the surface.

Remarks.—I was at first disposed to consider the small specimens a distinct species from the larger; the integument does not show the covering of spiny hairs which are conspicuous on parts of the large specimens, the proportions of the peduncular joints of the antennæ are not the same, the number of joints in the flagella are very different; on the inner plate and palp of the first maxillæ, on the inner plate of the second maxillæ, on the outer plate of the maxillipeds, there are differences in the number of teeth or of setæ; on gnathopods, peræopods, and uropods there are similar differences of proportion or of number of spines and spine-groups; but all these distinctions explain themselves very naturally and consistently on the hypothesis that the small specimens are the young and the large full-grown.

The species has a considerable resemblance to *Atylus austrinus*, Spence Bate, from Sydney, but in that the "dorsal surface is not denticulated," though the specimen was large, "$\frac{12}{20}$ths of an inch," and notably it differs from the present in having "posterior pair of pleopoda naked, and considerably longer than the two preceding pairs."

That the present species is the same as *Atylus australis*, Miers, cannot, I think, be doubted, although Mr. Miers did not find the accessory appendage of the upper antennæ in any of his four specimens, and though he speaks of the maxillipeds as being *five-jointed*, a description possibly suggested by the groove which runs across the base of the outer plate of the maxillipeds.

So far as I can judge from Mr. Haswell's description and figure of his *Atylus megalophthalmus*, from Clark Island, Port Jackson, that is synonymous with the present species. Mr. Haswell speaks of it as very variable, "the size of the eyes and their degree of approximation above, the length of the antennæ, and the form of the gnathopoda being all subject to considerable variations," remarks which would well apply to *Atyloides australis*.

Atyloides assimilis, n. sp. (Pl. LXXVII.).

Rostrum minute, lateral lobes of the head rounded, not very prominent; third pleon-segment having the postero-lateral angles produced, but only minutely. Animal closely resembling *Atyloides australis*, Miers.

Eyes situated close to the lateral lobes of the head, large, reniform, retaining their dark colour in spirits.

Upper Antennæ.—First joint thicker and a little longer than the second, second thicker and a little longer than the third, all three with groups of setæ on the lower margin, one at the apex being long and spiniform; flagellum of sixteen joints, several of

which have long setæ, spiniform and plumose like those at the apices of the peduncular joints; the one-jointed accessory flagellum as long, or nearly so, as the first of the principal, tipped with a long plumose seta and a shorter one. In those specimens of *Atyloides australis* which are comparable in size with the specimen here described, the proportions of the joints of the peduncle differ, and the present specimen has more groups of setæ than larger specimens of the allied species.

Lower Antennæ with the fourth joint shorter than the fifth; the flagellum of eighteen joints, the first longer than any of the others, showing within the markings of the new joints preparing for the next exuviation, an appearance not unusual, and observed also in specimens of the allied species.

Upper Lip.—The distal part shallower and more broadly rounded than in *Atyloides australis.*

Mandibles.—On the cutting plate of the left mandible there are two denticles outside the most prominent tooth, while *Atyloides australis* has apparently only one in that position.

First Maxillæ.—There are six plumose setæ on the oblique distal margin of the inner plate, the apical the largest, and eleven spines on the distal margin of the outer plate, similar in structure to those of the kindred species.

Maxillipeds.—On the outer plates there are five spine-teeth on the distal part of the inner margin, not set so closely together as the more numerous teeth in the other species; the finger is rather longer in proportion to the third joint, and has a long cilium on the back, set further back from the base of the nail than in *Atyloides australis.*

First Gnathopods.—Side-plates somewhat squared below; on the inner surface of the hand there are six small groups of spines in line, beginning near the base, the sixth being on the front margin not far from the apex; in the large specimens of *Atyloides australis* there are five groups rather differently arranged, and in the small specimens four groups; the palm in the present species is more oblique, the finger reaching just beyond it as in the adult male of the other species.

Second Gnathopods.—These, like the first gnathopods, have few setules on the front margin of the first joint instead of many as in *Atyloides australis*, and the palm more oblique and more groups of spines on the inner surface of the hand than in that species.

Peræopods all broken below the third joint, the remaining portions not showing any characteristic difference from those of *Atyloides australis.*

Pleopods.—Cleft spines two or three, joints of the rami ten or eleven.

Uropods similar to those of *Atyloides australis*, except that the rami of the second pair appeared to be subequal, the outer rather the longer; but as the tips were damaged, this is a little doubtful, the fewness of the spines on peduncles and rami of all the pairs might be due to the smallness of the specimen.

Telson shaped like that of *Atyloides australis*, but not longer than the peduncle of the third uropods.

Length.—The specimen, in the position figured, exclusive of the antennæ, measured something less than one-fifth of an inch.

Locality.—From the screw of the Challenger on December 18, 1873, a date which corresponds with Station 142, off Cape Agulhas; lat. 35° 4′ S., long. 18° 37′ E.

Remark.—The specific name refers to the great likeness between this species and *Atyloides australis*.

Atyloides serraticauda, n. sp. (Pl. LXXVIII.).

Rostrum minute; first and second segments of the pleon with the postero-lateral angles forming a minute tooth; the second having about the middle of the so-called epimera or immovable side-plates a row of eight spines, the largest lowest, with an anterior row of four; third segment of the pleon having the postero-lateral angle toothed, with a rather larger tooth on the hind margin immediately above that at the angle; the lower margin having in its anterior half several submarginal spines singly and in groups. Surface hairy.

Eyes large, reniform, retaining colour in spirits, situated near the lateral lobes of the head, and with only a narrow space between them at the top of it.

Upper Antennæ.—First joint more than twice as long as broad, longer than the second and third together, its upper margin longer than the lower; second joint twice the length of the third joint, which is small, not twice as long as broad; flagellum with sixty-two joints remaining in the specimen examined, about five times as long as the peduncle; the accessory flagellum rudimentary, consisting of one conical joint, about half the length of the first joint of the primary flagellum, tipped with two or three small setæ, and having a small hair on the margin.

Lower Antennæ.—First three joints short, the first very little expanded, the gland-cone decurrent, and, like the first and third joints, with short setæ at the apex; the fourth joint equal in length to the preceding three united, a little shorter than the fifth, its upper margin produced in a small rounded projection; the fifth joint having like the fourth several groups of stiff setæ on the under or inner side; the flagellum of thirty-four joints, of which the first equals between three and four of those which follow it.

Upper Lip.—The outer plate rather narrowly rounded at the distal end, the central part of this margin closely set with microscopic teeth or spinules.

Mandibles.—Cutting plate with seven or eight teeth; secondary plate on left mandible widened distally, cut into five teeth; on the right mandible slight in structure,

distally divided into two long teeth, curved towards each other, a denticle projecting from the side of the inner and longer of the two; spine-row of about eight denticulate spines; molar tubercle close to the spine-row, with the denticles of the crown rather elongate; a small process between the molar tubercle and the palp; the palp is set over or a little in advance of the molar tubercle, the first joint short, the second with the outer rim slightly concave, having some spines along the surface towards the inner margin, the third joint a little shorter than the second, widening distally, the outer margin very convex, with a spine about a third of the way up it and another on the adjoining surface, also with a row of five long spines on the outer surface near the base, none on the inner margin, but some sixteen of various sizes on the broad, truncate, slightly oblique, distal margin.

Lower Lip.—Principal lobes rather deep and thick, little dehiscent, well ciliated on the inner margin.

First Maxillæ.—Inner plate rather large, with some sixteen plumose setæ along the inner and apical margins, that adjoining the actual apex being the longest and thickest; outer plate with eleven spines on the truncate distal margin, the denticulation of the spines being confined to the distal part of their inner margin and there having a prominent convex outline; the first joint of the palp longer than broad, with one or two spinules on the outer margin, the second joint wide, with one or two spinules on the convex outer margin, and eight or nine spine-teeth on the truncate distal margin, accompanied by several setæ or slender spines inserted on the surface below the spine-teeth.

Second Maxillæ.—The plates elongate, inner a little shorter than the outer, about equal to it in breadth, with a long row of plumose setæ on the surface, beginning low down on the inner margin, and spines passing round the apical and a little way down the inner margin; the outer plate with a similar arrangement of longer spines, also some short ones at the apical part of the outer margin, and two or three spinules near the base of it.

Maxillipeds narrow. Inner plates long, reaching to the distal end of the first joint of the palp, with several plumose setæ on the inner margin, three spine-teeth and some curved spines on the truncate distal margin; the outer plates not reaching to the distal end of the second joint of the palp, with fourteen or fifteen spine-teeth on the slightly concave inner margin, six curved setæ passing round the apical margin and distal part of the outer margin; there is a row of spines on the outer surface near the inner margin; first joint of the palp as long as the third; the second longer, bordered with not very numerous spines; the third with its distal margin as usual set round with spines, produced on the outer side over the base of the finger; the finger small, with a spine-like nail, near to which are three or four cilia; the dorsal cilium near the base very small. The figure of these maxillipeds shows the inner plates

gaping widely, as they happened to be drawn apart in mounting for the microscope, but it is of interest that in very few species could the inner plates have been thus drawn apart either accidentally or on purpose without fracturing the maxillipeds.

First Gnathopods.—Side-plates wider below than above, with two or three serrations at the hind corner of the convex lower margin. First joint reaching below the side-plate, with a few long setæ on the hind margin, and many spinules about both margins; second joint with a group of spines on the hinder apex, and spinules in other parts; third joint with groups of spines about the hind margin and near the pointed apex; the wrist not very much shorter than the first joint, considerably longer than the hand, with five groups of setiform spines on the front margin, and many groups of stronger spines along the hinder, and oblique part of the distal, margin; the hand parallel-sided, about three times as long as broad, armed like the wrist, with a group of short thick spines near the angle of the palm, within which, and not beyond it, the short finger closes over a convex palm set with setules. The numerous spines on the hind margins of the hand and wrist are of various lengths, all apparently with small accessory threads, and a great many, but not the longest, with broad bent tips and extremely fine pectination of the edges for some distance below the tips; the bent tip when seen broadside instead of in profile appears to be a distal expansion, somewhat paddle-shaped, with the convex edge presenting a slightly wrinkled look, and at the lower part broken into teeth; see the fig. *gn.2.sp.*

Second Gnathopods.—The side-plates longer than the preceding pair and of more even breadth. The branchial vesicles are shorter than the first joint of the limb, narrow oval, with a long neck. Marsupial plates much longer than the first joint, and of great breadth, with numerous setæ of moderate length. The limb in general similar to the first pair, but all the joints longer, the wrist with fewer spines, the hand equal in length to the wrist, with nine pairs of the broad-ended spines along the hinder margin, and five or six groups of spines on the inner surface adjoining.

First Peræopods.—Side-plates like the preceding pair, but larger. Branchial vesicles broader, as long as the first joint. Marsupial plates of great size. First joint reaching beyond the side-plate, with some spines on the hind margin, spinules on both margins; second joint with two groups on the hind margin; third joint longer than fourth, a little decurrent in front, ending obtusely, with slender spines at four points of the hind margin, and stouter ones at four or five points of the front; fourth joint with spines at six points of the hind margin, a few spinules in front; the fifth joint as long as the third, parallel-sided, with numerous groups of short spines on the hind margin, some setules on the front; finger curved, with a small projecting point of the inner margin adjoining the nail, and a small dorsal cilium near the base.

Second Peræopods.—Side-plates broader and longer than the preceding pair, not very deeply excavate behind. The branchial vesicles larger, a broader oval, the mar-

supial plates smaller than in the preceding pair; the limb in all material points resembling the first peræopods.

Third Peræopods.—Side-plates not very deep, hind lobe a little deeper than the front. Branchial vesicles smaller than in the preceding pair. Marsupial plates narrow, not very long. First joint of the limb broadly oval, broader above than below; the front margin with spines, the hinder, which is the more convex, serrate, the lower lobe scarcely at all overlapping the short second joint; the third joint rather shorter than in the two preceding pairs, with spines at four points on each margin, the hinder a little decurrent, ending obtusely; the rest of the limb missing.

Fourth Peræopods.—Side-plates with a lobe behind, very decurrent. First joint similar to that of the preceding pair but larger; third joint also longer, with six groups of spines on the front, four on the hind margin. The rest of the limb missing.

Fifth Peræopods.—Side-plates small, not decurrent. Branchial vesicles not nearly as long as the first joint, narrow, with parallel sides, a short piece at the base being much narrower than the rest. The first joint larger than in the preceding pair; the third joint rather straighter than in the preceding pair, with spines at five points on each margin, the spines stronger. The rest of the limb missing.

Pleopods.—There are long and short spines on the side and apex of the peduncles; the coupling spines are small, so far as observed, with one strong lateral retroverted tooth in addition to the apical, and a row of denticles along one edge; the cleft spines appear to be four in number; the joints of the rami fourteen to sixteen.

Uropods.—Peduncles of the first pair a little longer than the inner ramus; the rami slender, with spines on the edges and the blunt tips, the outer ramus shorter than the inner; peduncles of the second pair longer than the outer, shorter than the inner ramus, reaching back to about the same point as the preceding peduncles; the rami rather broader, respectively shorter than those of the first pair; peduncles of the third pair shorter than the rami; the rami broadly lanceolate, subequal, with spines on both margins, and little teeth on the inner margin near the base of the spines; the inner and upper ramus has its inner margin pectinate; both have a nail-like termination, with a cilium near the tip.

Telson longer than the peduncles of the third uropods, broadest at the base, longer than its greatest breadth; cleft for nearly three-quarters of its length, not dehiscent, lateral margins convex or a little sinuous, the distal end emarginate, the end of each lamina being cut into five teeth, with small cilia in the interstices.

Length.—The specimen, in the position figured, measured, from the front of the head to the back of the third pleon-segment, a quarter of an inch.

Locality.—Station 161, off Melbourne; depth, 33 fathoms; bottom, sand. Two specimens.

Remarks.—The specimen described is a female. The specific name refers to the apical serration of the telson.

The species has some remarkable resemblances to *Amphithopsis longimana*, Boeck, from which however it is clearly distinguished by its cleft telson. It is also generically distinguished from *Amphithopsis* by the spine-teeth on the inner margin of the outer maxilliped plate, but it should be noticed that while Boeck gives to this part in *Amphithopsis* the generic character *spinis tenuibus instructa*, he states that the species *Amphithopsis longimana* has it furnished with teeth, "den ydre Plades hele indre Rand er vaebnet med taetstaaende, men korte Taender."

Genus *Atylopsis*, n. gen.

Upper Lip with the distal margin more or less bilobed.

Mandibles with strong palp; the third joint as long as the second.

First Maxillæ with a few setæ on the distal margin of the inner plate.

Second Maxillæ with some plumose setæ on the surface of the inner plate.

Maxillipeds.—Outer plate without teeth on inner margin, not reaching the apex of the palp's second joint; third joint of palp apically produced over the base of the finger.

Antennæ with short peduncles.

First and *Second Gnathopods* similar in shape, the second larger than the first.

Uropods of the first and second pairs with the outer branch shorter than the inner; peduncles of the third pair short.

Telson subequal in length to the peduncles of the third uropods, cleft or emarginate.

The generic name points to the likeness between this genus and the Atylinæ of Boeck, although the upper lip is not apically rounded but incised.

From *Pontogeneia*, Boeck, which it closely approaches, it is further separated by having the third joint of the mandibular palp equal in length to the second, instead of much shorter.

From *Pherusa*, Leach, and its synonym *Amphithopsis*, Boeck, another near ally, it is distinguished both by the incised upper lip and by the telson being more or less divided; *Amphithopsis longimana*, indeed, has the apex of the telson a little incised, but that species disagrees with the generic definition both in this respect and in having teeth on the outer plate of the maxillipeds.

Had the type species of *Pherusa*, Leach, been anywhere described in detail, it might have been advisable to group the species of the present genus provisionally with it, but since the published descriptions of *Pherusa fucicola* only refer to the external characters, no advantage was to be gained by adopting a name which might afterwards prove more unsuitable than it seems at the moment. Boeck uses the shape of the distal margin of the upper lip as one of the characters by which he distinguishes his subfamilies; whether

it is in reality a mark of distinction on which great stress ought to be laid, is a matter still open to inquiry; in small specimens it does not lend itself very readily to the determination of the species, but its intrinsic importance cannot be judged by the student's convenience. But for the upper lip the present genus might be united with *Halirages*.

Atylopsis magellanicus, n. sp. (Pl. LXXIX.).

Head angled in front, with no proper rostrum; the first three segments of the pleon with the postero-lateral angles acute, a little outdrawn in the second, and more decidedly in the third, the hind margins sinuous.

Eyes rather large, reniform.

Upper Antennæ.—With the first joint longer and thicker than the second, but neither very long; the rest of these appendages was missing.

Lower Antennæ.—First three joints very short, the fourth shorter than the first of the upper antennæ; the rest missing.

Upper Lip with the distal end broadly and flatly rounded, with a slight tendency to be unequally bilobed. The figure in the Plate gives only a profile view; the description was made possible by the dissection of a second specimen after the Plate had been engraved.

Mandibles short and compact; the cutting plate short, divided into six or seven teeth, the outermost small, the two next considerably larger; the inner plate on the left mandible widening distally, the edge divided into five teeth, of which the lowest is the largest; the secondary plate on the right mandible was not well observed, but appeared to be as usual of slighter build than that on the left; spine-row of seven or eight serrate spines; the molar tubercle close to the spine-row, short but prominent, with the crown surrounded by long denticles; the process close above it is short and conical, and immediately succeeded by the palp, of which the first joint is short, the second broad, slightly concave behind, the surface near the front margin set with a few setæ or spines, those near the apex being long; the third joint is as long as the second, with the outer margin convex, with two spines on the outer surface near the base, the inner margin obtusely angled rather than convex, with three pairs of setiform spines near the centre, followed by five spines, pectinate strongly on two edges, of which the lower two are longer than those which follow, these five being succeeded by five more at the apex, of which the earlier two (especially the second) are stronger and more strongly pectinate than the remaining three.

Lower Lip.—Principal lobes little dehiscent, inner lobes short but rather thick; mandibular processes short, squared at the end.

First Maxillæ.—Inner plate oblong, the distal margin truncate, slightly oblique, carrying five plumose setæ, of which the innermost is not larger than the one next it,

and is succeeded on the apex by a small spine or spine-like cilium, of which there are three more along the inner margin; along this inner margin there is a hairy strip of the surface; the outer plate carrying on its truncate distal border eleven spines variously denticulate, the innermost the longest, the next much shorter, with the denticulation on the outer side; the second joint of the palp reaching beyond the outer plate, its distal margin cut into strong sharp teeth, between which are inserted six spine-teeth with serrate edges, the outermost the longest; four or five setiform spines are inserted on each surface just below the teeth.

Second Maxillæ.—The inner plate a little shorter and narrower than the outer, with a row of six plumose setæ on the surface, beginning below the centre of the inner margin; twelve or fourteen spines partially fringe the rounded apex and apical part of the inner margin; longer spines, plumose or pectinate, fringe the distal margin of the outer plate, increasing as usual towards the outer corner, and then followed by some short ones.

Maxillipeds.—Inner plates scarcely reaching so far as the distal end of the first joint of the palp, with plumose setæ on the inner margin, some small teeth (probably the usual three) and curved spines on the truncate distal margin; outer plates small, reaching beyond the middle of the second joint of the palp, inner margin slightly serrate, without teeth, with seven groups of slender, not acute, spines, inserted on the outer surface in pairs, except the lowest, which is solitary; beyond the rounded apex the distal border is armed with two plumose spines, followed by two plumose setæ; the first joint of the palp is short, with two setæ on the inner and one on the outer apex; the second joint, twice as long as the first, is fringed with setæ on its inner and oblique apical margin, with a group at the outer apex, and one on the outer margin below the apex; the third joint is longer than the first, being distally prolonged in a sort of triangular cap with ciliated edges over the base of the finger, the distal part of the inner margin is fringed with setæ, there is a small one in the middle of the hind margin, a group at the base of the cap, one near the tip of the cap, and some serrate spines near its base; the dorsal cilium of the finger is at some distance from its base; a group of three cilia is planted near the base of the long and large nail.

First Gnathopods.—Side-plates not very deep, wider below than above, slightly produced forwards, with some cilia along the lower margin, which is serrate towards the hinder angle. The first joint reaching beyond the side-plate, with some small spines along the margin; third joint rhomboidal, with two pointed apices, a group of spines on the lower margin, a few spines higher up, and the distal half of the hind margin lightly furred; the wrist as long as the hand, with groups of serrate spines on the hind margin and the free slope of the distal margin, the long front margin having spines at the apex; the hand more than twice as long as broad, widest at the palm, which is straight, slightly oblique, set with setules of various lengths, and defined by a group of stout spines of various lengths, and carrying a small plumose seta

close to the finger-hinge; there are five groups of spines along the hind margin of the hand, four near that margin on the inner surface, and other groups adjoining the front margin and its apex; the finger is short to match the palm, its inner edge divided into four decurrent teeth with cilia, the nail long and sharp, accompanied by cilia at the base; the dorsal cilium small, not far from the base of the finger.

Second Gnathopods.—Side-plates oblong, deeper than the preceding pair, a little wider below than above. Branchial vesicles a narrow oval, shorter than the side-plate. Marsupial plates broad oval, much larger than the branchiæ, longer than the side-plates, with no setæ in our specimen, but indications of their places of attachment. The limb in shape and armature resembling the first pair, except that all the joints are longer; the hand longer than the wrist, with an extra group or two of spines, and the finger with an extra tooth on its inner margin.

First Peræopods.—Side-plates, branchial vesicles, and marsupial plates as on the preceding segment, but rather larger. First joint of the limb reaching beyond the side-plate, broader and a little longer than in the second gnathopods; the second joint short; the third more than twice as long as broad, with small spines or setules at three points on each margin, and a group at each apex; the front apex decurrent, sharp, with a strong spine close to the tip.

Second Peræopods.—Side-plates very broad, at the greatest breadth broader than deep, the excavation behind wide but not very deep. Branchial vesicles reaching as far as the side-plate, but much less broad. The marsupial plates longer and broader than the branchial vesicles. The first and second joints as in the first peræopods; the third rather longer than these; the fourth joint shorter than the third, with groups of spines at three points of the hind margin, of setules at two points of the front margin; the fifth joint subequal in length to the third or a little longer, with groups of spines at six points of the hind margin, of setules at four points of the front; the finger strong, slightly curved, the inner margin produced into a short point in advance of the short nail.

Third Peræopods.—Side-plates broad, the hinder lobe rather deeper than the front. Branchial vesicles about as long as the first joint of the limb. Marsupial plates a narrow oval, reaching a little below the side-plates. First joint broad oval, wider above than below, with spines on the front margin, the hinder serrate with small cilia in the serrations; the second joint with spines at the front apex, overlapped behind by the lower lobe of the first joint; the third joint with four groups of spines in front, five behind, those on the decurrent hinder apex being numerous and strong; fourth joint shorter than the third, like it widest distally, with three groups of spines in front, two behind; the fifth joint longer than the third, not widening distally, with five groups of spines on the front margin, three on the hinder, and a group of cilia at its apex; the finger as in the preceding pair.

Fourth Peræopods.—Side-plates with a lobe rather deeply decurrent behind. Bran-

chial vesicles a little smaller than in the preceding pair. The first joint larger than in the third peræopods, but similar in shape; the second and third also similar, the third rather larger; the rest of the limb missing.

Fifth Peræopods.—Side-plates broader than deep. Branchial vesicles smaller than the side-plates. First joint larger than in the preceding pair, much broader above than below; the third joint similar in shape and armature, but larger than there; the fourth joint like that of the third peræopods, but longer, with four groups of spines in front and three behind; the fifth joint in like manner with six groups in front and four behind, in addition to the apical group of cilia; the finger rather more than half the length of the fifth joint.

Pleopods.—There is a group of four spines near the distal end of the peduncles (at any rate in the third pair), one of which is very long and strong; there are others less conspicuous in other parts; the coupling spines are very small, their teeth small and seemingly not much retroverted; the cleft spines are three in number; the joints of the rami numbering from eleven to thirteen.

Uropods.—Peduncles of the first pair long, with many small spines on the edges; the rami broken, their basal portions narrow, suggesting that they would be in total length shorter than the peduncles; peduncles of the second pair longer than the outer ramus, with two large spines on one margin, and one spine at the apex of the other margin; the outer ramus with pectinate edges, four spines along one margin, and an apical group of three spines, the inner ramus broader and longer, the end broken; peduncles of the third pair shorter than the one remaining ramus, which is lanceolate, with pectinate edges, and has three spines along one margin, and four along the other.

Telson not longer than the peduncles of the third uropods, longer than the breadth at the base, narrowing a little distally, cleft for about two-thirds of its length, a little dehiscent between the two acute apices, from which the distal margin slopes upward, having on each side two serrations in each of which there is a small cilium.

Length.—The specimen, in the position figured, from the front of the head to the back of the third pleon-segment, measured one-fifth of an inch.

Locality.—Station 313, off Cape Virgins, Patagonia, January 20, 1876; depth, 55 fathoms; bottom, sand; bottom temperature, 47°·8. Two specimens. Trawled.

Remarks.—The specimen examined and described was a female. The specific name refers to the place of capture. From *Iphimedia capensis*, Dana, renamed *Atylus capensis* by Spence Bate, which was taken at the Cape of Good Hope, the present species differs in having longer wrists, and the distal margin of the telson with fewer serrations. There are many points in which the imperfect state of the Challenger specimens on the one hand, and the brevity of Dana's description on the other, prevents

comparison. The likeness between the two species makes it probable that they belong to the same genus; the distance between the localities at which they were obtained adds a little to the probability that they are in fact specifically distinct.

Atylopsis dentatus, n. sp. (Pl. LXXX.).

Rostrum small, rounded, lateral lobes of the head not prominent, with sinuous outline; last segment of the peræon and first two of the pleon each dorsally produced backwards in a small tooth; first three segments of the pleon with the postero-lateral angles also produced in a small tooth, the lower border of the segment having a conspicuous spine; the integument rather hairy.

Eyes round, oval, near the front of the head, with slender ocelli.

Upper Antennæ.—First joint shorter than the head, longer than the second joint; second joint not much longer than thick; the rest missing.

Lower Antennæ.—First three joints short, gland-cone decurrent; fourth joint shorter than the first three united; the rest missing.

Upper Lip bilobed, very finely ciliated, one lobe more advanced and much broader than the other.

Mandibles.—Cutting plate divided into seven or eight teeth; secondary plate of the left mandible divided into five or six teeth, of which the lowest is the longest; on the right mandible the secondary plate is slighter, distally bifid, with two slender teeth conspicuous, the lower one the longer; spine-row of six plumosely serrate spines mixed with long cilia; close to the spine-row is the molar tubercle, the crown of which has several rows of strong denticles and a plumose seta; set just over the tubercle is the strong palp, the first joint a little dilated distally, the second rather stout, with a few spines near the front margin; the third joint as long as the second, with nine spines on the upper part of the front margin and the apex, of which the two actually at the apex are the slenderest, the others being broader and conspicuously pectinate on two edges; near the base, on the surface near the convex hind margin, are two pectinate spines, one much longer than the other, boldly pectinate in its lower part, and finely in the upper.

Lower Lip.—Principal lobes broad, distally somewhat narrowed and dehiscent, lightly ciliated; inner lobes short; mandibular processes short, blunt-ended.

First Maxillæ.—Inner plate small, with two setæ on the apex; outer plate carrying on the truncate distal margin ten spines, the three shortest of which are furcate, the others denticulate; the second joint of the palp reaching beyond the outer plate, broadest near the distal margin, which is dentate and has four spine-teeth of different lengths, besides two or three slender submarginal spines. Though only ten spines were seen on the outer plate, it is probable that the normal number is eleven.

Second Maxillæ.—The inner plate shorter and decidedly narrower than the outer, with two plumose setæ, one on the surface near the distal part of the inner margin, the other further from the inner and nearer the distal margin; on the distal margin there are six or seven spines, and rather more than that number on the outer plate, with the usual gradations.

Maxillipeds.—(These in dissection came away adhering to the first gnathopods.) The inner plates not reaching as far as the distal end of the short first joint of the palp, with a few plumose setæ on the inner margin, three small teeth and some slender curved spines on the truncate distal margin; the outer plates small, scarcely reaching beyond the middle of the second joint of the palp, the inner margin smooth, with a few submarginal spines on the outer surface near it, and four on the distal part of the inner surface; there are three curved spines in notches of the distal margin; second joint of the palp widening a little distally, not twice the length of the first, with a few slender spines on and near the front margin; the third joint rather longer than the first, produced in a short pointed ciliated cap over the base of the finger, the distal margin surrounded with spines; one spine near the middle of the hind margin; the finger small and slender, its inner margin sinuous, with a couple of cilia near the sharp spine-like nail; the dorsal cilium long, set not very close to the base of the finger.

First Gnathopods.—Side-plates short, oblong, but wider below than above, outdrawn at the lower front corner in a rounded angle. First joint of the limb reaching much below the side-plate, its margins almost naked; second joint short; third forming a sharp triangular tooth at the hinder apex, with a few pectinate spines near it, the front apex which rests on the wrist being also sharp; the wrist shorter than the first joint, equal in length to the hand, the front margin almost unarmed, the hinder armed at four points with pectinate spines; the hand a little widened distally, the front margin convex, longer than the hinder, carrying a few long setiform spines; the hinder margin straight, with a group of pectinate spines at the centre, and another at the apex, including a stout pectinate spine; the palm short, convex, quite distinct from the hind margin, yet not sharply defined, armed with a few setules, and having one that is plumose adjoining the hinge of the finger; the finger reaching with the nail beyond the palm, having a small decurrent tooth about the centre of its inner margin, and a few cilia near the nail; the dorsal cilium near the base, very small.

Second Gnathopods.—Side-plates small, oblong, both the lower corners rounded. The branchial vesicles as long as the side-plates, oval, flask-shaped. The first three joints of the limb as in the preceding pair, but longer; the wrist distally broader than in the preceding pair, not so long as the hand; the hand similar to that of the first gnathopods, but considerably longer and broader; the finger thicker.

First Peræopods.—Side-plates and branchial vesicles a little larger than in the preceding segment. First joint of the limb reaching much below the side-plate, broader

and longer than in the gnathopods; the second joint short; the third scarcely decurrent in front, a little longer than the fourth, shorter than the fifth joint, weakly armed, the longest spine being on the front apex; the fourth joint with spines at three points of the straight hind margin, setules at two points of the convex front; the fifth joint almost straight and of even breadth, with spines at four points of the hind margin, and three groups of setæ in front; the finger almost straight on the inner margin as far as the cilium at the base of the much-curved nail; a small dorsal cilium near the base of the finger is followed by two others at intervals on the dorsal margin, which has a minutely pectinate appearance.

Second Peræopods.—Side-plates a little longer and broader than the preceding, the attachment narrow, the excavation behind being broad and shallow, the hind margin below the excavation sloping gently forwards. The limb missing below the third joint; the upper part closely resembling that of the first peræopods.

Third Peræopods.—Side-plates broader than the preceding, the hind lobe a little deeper than the front. First joint broadly oval, rather wider above than below, with spinules at two points and spines at two points of the front margin, and six spinules in the serrations of the hind margin; there is also a spine on the inner surface at the hinder apex within the wing; the short second joint with a spine at the front apex; the third joint with spines at three points on each margin, those on the squared slightly decurrent hinder apex forming a tolerably strong group; the fourth joint a little expanded distally, shorter than the third joint, carrying spines at three points in front and on the hinder apex; the fifth joint with spines at four points in front, and two behind; the finger as in the preceding peræopods.

Fourth Peræopods.—Side-plates with a somewhat decurrent hind lobe. The branchial vesicles reaching a little below the hind lobe of the side-plate, and having apparently a small narrow accessory sac near the base. The first three joints of the limb resemble those of the third peræopods, but the first and third are larger; the rest of the limb missing.

Fifth Peræopods.—Side-plates small, almost semicircular, but the front margin bent and flattened. Branchial vesicles minute, oval, pointing backwards. The first joint longer and much broader than in the preceding pair, much broader above than below; the third joint similar to that in the preceding pair, but rather larger; the rest of the limb missing.

Pleopods.—Coupling spines very small, seemingly with only one lateral tooth on each side below the apex; of cleft spines I could only discover two even in the first pair, a short one with another much longer below it, having the arms long, nearly equal; the inner ramus with seven joints, the outer with nine, the first joint in each as long as three or four together of those that follow.

Uropods.—Peduncles of the first pair shorter than the inner, longer than the outer,

ramus; outer ramus much shorter than the inner, with two spines on the margin, and a group at the apex; inner ramus with three on the margin and a strong group at the apex; peduncles of the second pair a little longer than the outer, much shorter than the inner, ramus; the outer ramus about half the length of the inner, with one spine on the margin and a group at the apex; the inner ramus with three spines on the pectinate inner margin and a group at the apex; peduncles of the third pair very short above, scarcely reaching back so far as the peduncles of the other two pairs, but below produced beyond them in a triangular apex; the outer ramus narrower than the inner and about half its length, with three spines along its margin, the apex acute; the inner ramus also with an acute apex, rather longer than the inner ramus of the first or second pair, its inner margin pectinate, carrying four or five spines, the outer margin four.

Telson as long as the peduncles of the third uropods, but not reaching back quite to the end of their produced tips, longer than broad, with a short, but definite, rather dehiscent, cleft, and the apices rounded; the lateral margins converging slightly; a cilium on either side near the margin, below the centre.

Length.—The specimen, in the position figured, measured under a quarter of an inch.

Locality.—Station 313, off Cape Virgins, Patagonia, January 20, 1876; depth, 55 fathoms; bottom, sand; bottom temperature, 47°·8. One specimen. Trawled.

Remarks.—The specific name refers to the dorsal dentation. A small specimen, remarkably like this species, so far as could be observed, but with the hands of the gnathopods more quadrate, the palms more oblique, was obtained at the surface, February 5, 1875, that is between Stations 212 and 213, at about lat. 6° N., long. 123° E., therefore at an enormous distance from the locality of the specimen described and figured. As in the second specimen the antennæ, peræopods, and uropods were broken, it does not seem worth while to go into fuller details about it.

The present species shows a very great resemblance to *Paramphithoë tridentatus*, Bruzelius, which Boeck has named *Halirages tridentatus;* it is separated from it by the short outer branches of all three pairs of uropods, the somewhat different termination of the telson, as well as by the bilobed upper lip, and some other details of the mouth-organs. From its compatriot, *Atylopsis magellanicus*, it is distinguished by the dorsal teeth, and by the termination of the telson.

Atylopsis emarginatus, n. sp. (Pl. LXXXI.).

Rostrum small, with rounded point; lateral lobes of the head sinuous, lower angle slightly produced, rounded; first and second segments of the pleon postero-laterally angled but not acutely, third segment rounded.

Eyes indistinctly made out, seemingly large, reniform, colourless in spirits.

Upper Antennæ shorter than the lower. Peduncle short, first joint once and a half as long as broad, not equalling the length of the next two united ; third a little shorter than the second ; flagellum of thirty joints, the first longer than the next two united, carrying three groups of cylinders ; many of the other joints with cylinders longer than the joints ; the secondary flagellum one-jointed, minute, not half the length of the first joint of the principal flagellum, with a long seta inserted in the tip, and two or three cilia or hairs. In the young extracted from the mother's pouch, the flagellum of the upper antennæ consists of six long joints.

Lower Antennæ.—First three joints very short, subequal, gland-cone short, decurrent ; fourth joint longer than the preceding three united ; fifth joint rather narrower but longer than the fourth ; flagellum of thirty-three joints, the first six rather thick, the first as long as two or three together of those that follow. In the young the flagellum is of eight or nine joints.

Upper Lip.—The distal border with a small non-central emargination, the cilia facing one another on either side of it rather stout and tooth-like, those more remote as usual hair-like.

Mandibles.—Cutting plate divided into seven teeth, of which the lowest three are the largest ; secondary plate of left mandible distally widened and divided into five teeth, the lowest of which is the largest ; secondary plate of the right mandible slight in structure, showing only two terminal teeth, the hinder of which is much the longer ; spine-row on the left mandible of nine curved pectinate spines, the first broader than the rest, with oblique denticulate apex ; the right mandible showed only six spines, without a specially broad one ; close to the spine-row is the molar tubercle with strongly dentate crown ; above it a blunt-headed process, and above this the strong palp, the first joint a little expanded distally, as also is the second, which has on the surface near the inner margin about a dozen spines, slightly plumose, those near the apex the longest ; the third joint is subequal in length to the second, the outer margin convex, with two long spines on the outer surface near the base, many short spines along the inner margin and four longer ones at the apex ; the outer surface almost covered with adpressed cilia. In the young there appeared to be only three short spines at the apex of the third joint, with none along the inner margin.

Lower Lip.—Principal lobes rather broad and deep, little dehiscent, strongly ciliated round the distal and inner margins ; inner lobes broad and thick and short ; mandibular processes short, squared at the ends.

First Maxillæ.—Inner plate small, with five (in a second specimen only four) plumose setæ on the oblique distal margin, followed by four setules, two of which are upon the slightly produced apex, and two upon the inner side of it ; outer plate carrying eleven spines on the truncate margin, the outermost long and straight, slightly denticulate, set among some long cilia ; the next shorter, with a long apical tooth on the inner side or

front, and a small denticle (on one maxilla two unequal denticles) behind it, the three following pairs consisting of a long slender slightly denticulate spine, and a shorter with from five to six radiated denticles near the apex, the longest lowest; the second joint of the palp reaching beyond the outer plate, its outer margin convex, the broadest part of the joint near the centre; the distal margin strongly toothed, with six or seven (longer or shorter) spine-teeth in the interstices, the outermost the longest; three slender submarginal spines attend the spine-teeth, and three are placed, not in line, on the surface near the middle of the outer margin.

Second Maxillæ.—Inner plate equal in breadth and almost in length to the outer, with a row of four plumose setæ beginning about the middle of the inner margin, and advancing but little on to the surface; the upper part of the inner margin and the apex fringed with short spines; the outer plate has long spines, plumose below and pectinate above, round the upper part of the inner margin and the apex, with some small spines on the upper part of the outer margin.

Maxillipeds.—Inner plates reaching a little beyond the first joint of the palp, with three spine-teeth on the truncate distal margin, several short curved spines, and a slender submarginal spine-tooth close to the apex of the inner margin; the outer plates not reaching the distal end of the second joint of the palp, strongly ciliated on the outer surface near the outer margin, the inner margin serrate, devoid of teeth, with a row of slender spines on the outer surface, not far from the inner margin; round the distal margin and descending the outer are ten or more long curved spines and setæ, forming the usual gradation from one into the other; first joint of the palp short; second nearly twice as long, distally a little expanded, with several long spines on the straight inner margin; the third joint slender, equal in length to the first, produced in a small cap over the base of the finger, the edge of the cap appearing pectinate by the projection of adpressed cilia; the finger slender, with a sharp spine-like nail accompanied by a cilium at its base; dorsal cilium of the finger small, near the base.

Of the *triturating organ* of the stomach, all the spines appeared to be long and slender.

First Gnathopods.—Side-plates short and squared, slightly outdrawn at the lower front angle. First joint reaching much beyond the side-plate, longer than the next three joints put together, but shorter than the hand; second joint short; third a little longer, rhomboidal, with several spines about the distal margin; wrist triangular, distally wide, somewhat cup-like, with many pectinate spines on the hind margin; the hand broader than the wrist, more than twice as long as its own breadth, the long front margin convex, smooth, except at the apex, the shorter hind margin with four groups of pectinate or plumose spines; the palm oblique, sinuous, with a tooth process followed by a small crenate emargination near the hinge of the finger; the sinuous portion is cut into very numerous spinule-like close-set teeth; the strong curved finger has a small dorsal cilium near the

base, its inner margin cut into many adpressed teeth from base to nail; the nail projecting just beyond the palm, closing down between two rows of thick strong spines, of which the largest are innermost.

Second Gnathopods.—Side-plates small, oblong, a little longer than in the preceding pair, but distally rather narrower. Branchial vesicles oval or flask-like, broader below than above, about as long as the first joint. The limb closely resembling the first gnathopods in shape and armature; the first joint a little longer, the hand considerably longer, with six groups of spines on the hind margin. In the female specimen the gnathopods were slighter, especially as regards the hand, which in the first pair did not exceed the length of the first joint, in the second was shorter than it. Marsupial plates much longer than the first joint.

First Peræopods.—Side-plates rather longer and broader than the preceding pair. Branchial vesicles similar in shape, rather larger. Marsupial plates long and broad, the distal margin carrying nine or ten setæ. First two joints like those of the preceding pair; third joint rather longer than the fourth, with a very few spinules on the margins, of which the front one is slightly decurrent; the fourth joint spined at three points of the hind margin; the fifth joint longer than the third, slightly curved, with spines at five points of the hind margin; finger curved, considerably more than half the length of the fifth joint.

Second Peræopods.—Side-plates broader and longer than the preceding pair, excavate behind, the margin below the excavation sloping forwards to the lower margin. The first three joints of the limb as in the preceding pair; the rest missing.

Third Peræopods.—Side-plates with the hind lobe deeper than the front. The first joint little expanded, but rather wider above than below, its length twice its breadth; front margin nearly straight, with some small groups of spines, hind margin scarcely less straight, slightly serrate; second joint very short, partially overlapped by the hind lobe of the first; third joint rather broader and a little shorter than in the second peræopods, decurrent behind. The rest of the limb missing in this and the two succeeding pairs.

Fourth Peræopods.—Side-plates bilobed, the hinder lobe the deeper. Fig. *prp.*4. represents the side-plate alone without its appendages. The limb like the preceding, but with the first and third joints longer.

Fifth Peræopods.—Side-plates with a single lobe. Branchial vesicles small. First joint like the preceding, except that it is larger, and that it is more expanded at the top than below; the second and third joints resemble those of the preceding pair.

Pleopods.—Coupling spines very small, with three or four retroverted teeth along each of two edges; cleft spines apparently only three or four in number, with long unequal arms; joints of the rami numbering about thirteen or fourteen.

Uropods.—Peduncles of the first pair longer than the outer, shorter than the inner, ramus; the rami both long, pointed, with small spines on the margins; peduncles of the

second pair shorter than the rami; the outer ramus much shorter than the inner, which reaches nearly as far back as the inner of the first pair; these rami also have spines on the edges; peduncles of the third pair much shorter than the rami, which are long, the outer rather shorter than the inner, and in the female considerably so; the margins carry spines, more in the male specimen than in the female.

Telson longer than the peduncles of the third uropods, though not quite reaching the tips of them, a little longer than broad, very little narrowed distally, with a distal arched emargination, not as deep as wide, forming two triangular apices, a little serrate on the outer margins; the arch of the emargination is smoothly rounded in the female, but in the male is (perhaps accidentally) rather angular.

Length.—The specimen, in the position figured, measured, exclusively of the antennæ, a little more than a quarter of an inch.

Locality.—Station 145A, off Marion Island, December 27, 1873; depth, 310 fathoms; bottom, volcanic sand. Two specimens, male and female. Dredged.

Remark.—The specific name refers to the shape of the telson.

Genus *Harpinioides*, n. gen.

Upper Antennæ longer than the lower, peduncle short, secondary flagellum minute.

Mandibles with elongated cutting-edge, the spines of the spine-row numerous, the second joint of the palp wide, the third equal in length to the second.

First Maxillæ with nine spines on the outer plate.

Maxillipeds with the inner plates reaching scarcely beyond the base of the first joint of the palp, the outer plates narrow, fringed on the inner margin with numerous slender spine-teeth; the finger of the palp narrow.

The First and *Second* pairs of *Gnathopods* alike, the wrist short, the hand long, tapering, subchelate.

The Third, Fourth, and *Fifth Peræopods* with the first joint in each broadly dilated; the *Fourth* longer than the *Third*, the *Fifth* than the *Fourth.*

In the *First* and *Second Uropods* the outer ramus shorter than the inner, in the third pair the rami lanceolate, subequal, longer than the peduncles.

The Telson not shorter than the peduncles of the third uropods, not cleft, slightly emarginate.

The generic name is derived from that of the genus *Harpinia*, Boeck, and εἶδος, likeness; it refers to the curious resemblance which the type-species shows in the form of the mandibles and maxillipeds to the genus in question; the gnathopods are peculiar, not indeed alien to *Harpinia*, but not attracting attention by any special resemblance to it. On the other hand the antennæ, peræopods, and pleon connect the genus closely with the Atylidæ.

Harpinioides drepanocheir, n. sp. (Pl. LXXXII.).

Rostrum minute, sub-depressed; back rounded; the first two segments of the pleon with the postero-lateral angles slightly rounded; the third segment, which is the longest, has the corners strongly rounded; there are some submarginal spines on the lower borders of these three segments.

Eyes not observed.

Upper Antennæ.—Peduncle short, the first joint longer than the next two united, and much thicker than either; the second longer and thicker than the third, which is nearly equal in length to the first two joints of the flagellum united; all the three joints have on the inner side apical groups of slender divergent spines, the second has also a group near the centre; the flagellum more than twice as long as the peduncle, of twenty-four joints, of which the first is the longest. Secondary flagellum one-jointed, very narrow, shorter than the first joint of the primary, the truncate end tipped with setules.

Lower Antennæ shorter than the upper, but with peduncles rather longer. The first three joints short, the first a little inflated, the gland-cone small, decurrent, the fourth joint not equal in length to the preceding three united, the fifth a little shorter and narrower than the fourth, like it having a group of small spines or setæ about at the centre, and two apical groups; the flagellum shorter than the peduncle, of fourteen joints.

Upper Lip with the distal border broad and flat, very slightly ciliated.

Mandibles.—The cutting plate in the left mandible with a long, nearly straight, very oblique edge occupied by about thirty-five minute denticles, closely set, with their points upwards, a large prominent tooth at the top, and at the lower end, which is very advanced, two or three large teeth; the secondary plate short, broad, especially at the distal margin, which is oblique, with a large tooth above and another below, the intermediate space showing seven little denticle-like prominences, of which the upper three are close together; spine-row of nine or ten denticulate spines accompanied by cilia, the shorter spines at either end of the row, the arrangement somewhat fan-like; the molar tubercle small and slender, a little ciliated, but apparently without any denticulate crown; the cutting plate of the right mandible with only twenty-six denticles on the oblique edge, a prominent tooth at either end, and a third on the under margin some way to the rear of the lower apex; the secondary plate represented by a small straight spine, prickly at the distal end, shorter than the spines of the spine-row, which are ten in number; of the palp, which is set slightly in advance of the molar tubercle, the first joint is a little expanded distally, the second is stout, narrowest at the base and apex, carrying a row of five rather large spines on the inner surface, and one on the outer, near the very convex front margin; the third

joint is equal in length to the second, its surface covered with adpressed cilia, its apex armed with three small, lightly feathered spines.

Lower Lip.—Principal lobes broad, with a small group of spine-like cilia, some seven in number, with furcate tips, at the inner part of the distal margin; mandibular processes short, squared at the ends.

First Maxillæ.—Inner plate small, oval, with one plumose seta near the apex; outer plate with nine spines on the oblique truncate distal margin, the outermost the strongest, curved, smooth; of the others three are short, stout, smooth, the rest long, and very slightly denticulate; the second joint of the palp expanded a little distally, reaching beyond the outer plate, its distal border toothed, carrying seven or eight slender spine-teeth, accompanied by four or five submarginal spines. The comparative smoothness of the spines on the outer plate may be noticed as a rather unusual feature.

Second Maxillæ.—Inner plate a good deal shorter and narrower than the outer; near the middle of the inner margin is a long plumose seta, followed by a second on the surface, and then a third near the apex, at which there are two pairs of spines, succeeding three small spines at the top of the inner margin; the outer plate has seven or eight long spines at the narrowed apex, succeeding a row of five on each margin, the spine-bearing part of the outer margin being oblique.

Maxillipeds narrow. The inner plates scarcely reaching beyond the base of the first joint of the palp, with two long spiniform plumose setæ on the inner margin, two long spines much like them, but slightly curved, at the oblique outer end of the distal margin, at the inner truncate portion of which there are two spine-teeth and a slender submarginal spine; the narrow outer plates do not reach the distal end of the second joint of the palp; the serrate inner margin fringed with sixteen long spine-teeth, followed by six still longer on the oblique toothed distal margin; the first joint of the palp short, with a spine at the outer apex; the second broad, not nearly twice as long as the first, with nine or ten long spines spaced along the inner margin, and four or five about the distal border; the third broad, as long as the first, with a group of spines on the outer margin, several round the distal border, and several on the surface of different sizes, some very short but plumose like some of the long ones; the finger slender, about as long as the third joint, with a couple of cilia at the base of the nail.

First Gnathopods.—Side-plates large, much broader below than above, somewhat outdrawn in front, with the anterior angle rounded. The first joint reaching a little below the side-plate, its front margin sinuous, fringed with some setæ, and carrying two large spines near the distal end, the hinder margin slightly convex, with some long setæ near the centre and a spine at the apex; the second joint short; the third rhomboidal, with a few spines on the hinder and distal margins; the wrist short, triangular, distally cup-like, equal in length to the preceding joint, with an apical spine in front, the short free hind margin fringed with spines; the hand curved, shorter than the first joint,

about three times as long as the wrist, broad at the base, narrowing almost to a point at the hinge of the finger, the front margin smoothly convex, with short setæ at the apex, the hind margin gently sinuous, without any definite palm; the long, slender, slightly curved finger, about half the length of the hand, closes over the concave part of the hand's hinder margin, so as to leave a narrow cavity; its tip touches the margin between two pairs of setæ; between the lower of these two pairs and the hinge there are on the margin six setules and another pair of setæ.

Second Gnathopods.—Side-plates oblong, with the corners rounded, longer than the preceding pair, but not so broad below. The limb a rather elongated replica of that of the first gnathopods.

First Peræopods.—Side-plates in general like the preceding pair, but longer, the hind margin very straight, its lower corner scarcely rounded. Branchial vesicles small and narrow. Marsupial plates elongate, considerably exceeding the length of the first joint, narrow above, a little expanded below. First joint reaching a little beyond the side-plate, fringed along the front margin with many setæ, on the hind margin carrying a group of very long setæ at the centre, two groups of short ones below it, and spines at the apex; second joint short, a spine at the hinder apex; third joint longer than the fifth, much longer than the fourth, a little decurrent in front, with an apical spine, the hind margin having three groups of setæ; the fourth joint has a small apical spine in front, and at six points of the hind margin setæ, more or less plumose, of greater length successively towards the apex; the fifth joint narrowing a little distally, with spines at four points of the nearly straight hind margin, the front margin a little convex, with setules at the apex; the finger slightly curved, more than half the length of the fifth joint, the margins smooth, except for a very small dorsal cilium near the hinge.

Second Peræopods.—Side-plates broader than the preceding pair, not very deeply excavate, hind margin below the excavation sloping very slightly forwards. Branchial vesicles like those of preceding pair, but rather larger. The limb not materially different from that of the first peræopods.

Third Peræopods.—The hind lobe of the side-plates deeper but narrower than the front one. Branchial vesicles not reaching below the hind lobe of the side-plate. Marsupial plates also short and narrow. First joint almost as broad as long, and of nearly equal breadth throughout, the hind margin with a few serrations and cilia in the notches, the front margin carrying several setæ and spines, a long spine at the apex; a group of long setæ on the inner surface; second joint short, with an apical spine in front; third joint longer than the fourth, a little decurrent, with spines at four points in front, at three behind; fourth joint with spines at three points in front and at the apex behind; the fifth joint subequal in length to the third, with spines at five points in front; one group of setules at the apex of the hind margin, and another a little

higher up; the finger as in the preceding pair. In the specimen examined, the first joint of one limb of this pair was only half the size of the first joint of its fellow.

Fourth Peræopods.—Side-plates with a long decurrent hind lobe. Branchial vesicles narrow above and below, reaching a little beyond the side-plates. First joint of the limb resembling that of the preceding pair in shape, but exceeding it in size; the rest of the limb also similar to the preceding but longer.

Fifth Peræopods.—Side-plate small, rounded behind. First joint of the limb not longer, but broader, than that of the preceding pair, the expansion behind being longer than the front part of the joint; the rest of the limb very similar to the preceding pair.

Pleopods.—Coupling spines small, the base widened, three lateral retroverted teeth immediately below the apical; cleft spines three to four, with very unequal arms; joints of the rami numbering from nine on the inner to twelve on the outer.

Uropods.—Peduncles of the first pair reaching a little beyond those of the second, rather longer than the inner ramus, apically a little produced on the inner side, with a large curved spine issuing from the apex; the outer ramus shorter than the inner, with three or four spines on the inner margin, and a group, of which one is stout, on the blunt apex; the inner ramus similarly armed; peduncles of the second pair longer than the outer, shorter than the inner, ramus; the rami armed as in the preceding pair; peduncles of the third pair shorter than the rami, which are broad, lanceolate, equal in length, or the outer slightly the shorter, nearly as long as the inner ramus of the first pair, with three or four small spines on each margin.

Telson longer than the peduncles of the third uropods, reaching just as far back, its breadth at the base contained once and a half in its length, the sides converging so that the distal end is half the width of the broadest part; a small triangular emargination is flanked on either side by an apex incised for the insertion of a spine; the place of insertion of a cilium was indicated on each margin a little above the apex, but the cilia were not present.

Length.—The specimen, in the position figured, measured, exclusively of the antennæ, a quarter of an inch.

Locality.—Kerguelen. Two specimens; the one examined and described was a female.

Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. One specimen. Dredged.

Remark.—The specific name, derived from the Greek words δρέπανον, a sickle, and χείρ, the hand, alludes to the peculiar sickle-shaped hands of the two gnathopods.

Genus *Tritæta*, Boeck, 1876.

1870. *Lampra*, Boeck, Crust. amph. bor. et arct., p. 108.
1871. *Atylus* (*?*), Metzger, Die wirbellosen Meeresthiere der ostfriesischen Küste, p. 28.
1875. *Dexamine*, Stebbing, Ann. and Mag. Nat. Hist., ser. 4, vol. xv. p. 1 (sep. copy).
1876. *Tritæta*, Boeck, De Skand. og Arkt. Amph., p. 317.
1878. *Atylus*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. ii. p. 370.
1880. *Polycheria*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 345.
1880. *Dexamine*, Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 35.
1882. *Polycheria*, Haswell, Catal. Australian Crustacea, p. 262.
1882. ,, Thomson, Trans. New Zealand Inst., vol. xiv. p. 233.
1882. *Lampra*, Sars, Oversigt af Norges Crustaceer, p. 26.
1882. *Atylus* (*pars ?*), Sars, Oversigt af Norges Crustaceer, p. 101.
1886. *Dexamine*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 508.
1886. *Tritæta*, Norman, Museum Normanianum, pt. iii. p. 15.
1887. ,, Chevreux, Catal. Crust. Amph. Bretagne, p. 16.

For the definition of the genus, see Note on Boeck, 1876 (p. 454). The type species of the genus is *Atylus gibbosus*, Spence Bate; Boeck observes that *Dexamine brevitarsus* [*brevitarsis*], Grube, also belongs to it; it will further include the species *Dexamine antarctica*, Stebbing, and probably also *Atylus falcatus*, Metzger, and *Dexamine dolichonyx*, Nebeski. *Polycheria tenuipes*, Haswell, *Polycheria brevicornis*, Haswell, *Polycheria obtusa*, Thomson, are, I think, synonyms of *Tritæta antarctica*, Stebbing, and *Atylus uncinatus*, Sars, seems to be a synonym of *Tritæta falcata*, Metzger.

Tritæta kergueleni, n. sp. (Pl. LXXXIII.).

Rostrum minute, back of peræon broad, pleon carinate except on the front part of the first segment; animal globose when the head and tail are drawn towards one another, but with the legs remaining exserted. The first three pleon-segments with the lower margins spined, forming an angle with the hind margin, which is not acute or outdrawn; the three following segments by the dorsal processes of the fourth and sixth presenting the profile of an aged human face. (Compare Note on Rondelet, 1554, p. 3.)

Eyes round-oval, with numerous ocelli, situated near the slight lateral lobes of the head, dark in the specimens preserved in spirits.

Upper Antennæ.—First joint shorter than the head, not twice as long as thick, second joint twice the length of the first, not tapering regularly, but thicker in the basal than the distal half, the lower edge of this and the preceding joint having several setæ; the third joint very small, not much thicker than the proximal, nor much longer than the distal, joints of the flagellum; flagellum of twenty joints, increasing in length and decreasing in thickness, though not quite regularly, to the terminal joint which is short; each, the last excepted, carries a cylinder longer than the joint.

Lower Antennæ.—Peduncle longer than that of the upper antennæ; the first three joints very short, the gland-cone well developed, the third joint carrying several setæ on its lower margin; the fourth joint long, shorter than the second of the upper antennæ, which it resembles in shape; the lower margin armed with slender spines; the fifth joint straight and thin, a little shorter than the fourth, armed with slender spines, of which many are elongate; the flagellum of eleven slender joints, armed with slender spines, together shorter than the peduncle.

Upper Lip broadly and smoothly rounded, delicately ciliated.

Mandibles.—Cutting plate with the edge divided into six teeth, the outermost the largest; secondary plate on the left mandible similar to the principal, but smaller; on the right mandible this plate is slighter, and ends in two prominent teeth, which curve the one towards the other, the outer being the longer, and having two or three denticles on its side; the spine-row of three plumose spines on the left, and two on the right mandible; the molar tubercle large and strong, the crown of irregular shape, set with very many small denticles, and carrying at one corner a short plumose seta; it has on the forward margin a small protuberance; there is an articulating process, but no palp.

First Maxillæ.—Inner plate small, oval, with two plumose setæ on the inner margin, the larger close to the apex; the outer plate broad, with nine spines on the truncate distal margin, several of them long and denticulate, three short, denticulate on both edges near the apex; the palp reaching a little beyond the outer plate, the first joint short, the second long, with six slender spines on the oblique distal margin, and one some way from the apex on the outer margin.

Second Maxillæ.—Inner plate narrower than the outer, carrying eleven plumose spines, seven on the distal, four on the inner margin; the outer plate with about sixteen spines round the distal margin, the outermost a small one.

Maxillipeds.—Inner plates short, not reaching so far as the distal end of the first joint of the palp, carrying five long plumose spines on the squared distal margin, two or three on the inner margin, and some transverse rows on the outer surface, in one of which two of the spines exceed all the others in stoutness; the outer plates very long, reaching beyond the middle of the third joint of the palp, the slightly concave inner margin armed with eighteen or nineteen small sharp spine-teeth, and the apex with one rather larger than the rest; first joint of the palp short, the second considerably longer, broad, armed on the inner margin, and the outer surface near it, with numerous groups of long slender spines; the third joint longer than the first, beset with numerous groups of spines; the finger very short, the sharp nail accompanied by a cilium.

First Gnathopods.—Side-plates short, sharply angled below in front, the point projected forwards. The first joint, as in all the legs, reaching much beyond the side-

plates, its length equal to that of the wrist and hand combined, carrying some long, distally serrate spines or spiniform setæ near the front margin; second joint very short, third longer than broad, carrying on most of the hind margin and along the squared distal margin many long spines, the wrist much longer than the hand, expanding behind and then again slightly contracting, the hinder part armed with many long spines; the hand longer than broad, narrow at the base, but presently expanding, beset on both margins and surfaces with numerous groups of spines of various lengths, and, like those on the preceding joints, finely pectinate; the palm border is finely pectinate, a little convex, with some defining spines; the finger reaching a little beyond the palm, the inner margin produced into a small tooth at the base of the nail, with a cilium; the dorsal cilium small, near the base.

Second Gnathopods.—Side-plates deeper than those of the preceding segment, front margin sinuous, its apex pointed forwards. Branchial vesicles large, simple, much longer and broader than the side-plates. Marsupial plates narrower, but longer than the branchial vesicles, with many long setæ along one margin and the apex, fewer and shorter on the other margin. The joints of the limb similar to those of the first gnathopods, but with the first, third, fourth, and fifth joints longer.

First Peræopods.—Side-plates shallow, produced downwards in front into a long tooth directed a little forwards. Branchial vesicles and marsupial plates as in the preceding pair. First joint of the limb broader, but not longer, than the third joint, armed with spines on both margins; the second joint short, with a group of spines at the apex; the third joint longer than the next two united, a little curved, with spines on both margins, those on the hinder margin, as in the first joint, the longer; fourth joint shorter than the fifth, with spines about the distal end; fifth joint with spines at two points on the front margin and a group of setæ at its apex, at the back expanding a little before the end, and forming a sharp tooth tipped with two spines, against which the finger impinges; between this tooth and the narrow distal end is a large, angular cavity; there are spines along the surface, and a group close to the hinge of the finger, one being incurved; the finger itself is much curved, making with the tooth of the hand a powerful grasper; it has a small dorsal cilium near the base, and a very small cilium on the inner margin near the root of the nail.

Second Peræopods.—Side-plates a little broader than in the preceding pair, otherwise scarcely differing; the limb and its appendages also in close agreement with those of the first peræopods.

Third Peræopods.—Side-plates as broad as the preceding and as deep as their hind margin, the front lobe the deeper and a little pointed. The branchial vesicles like those of the preceding pairs. The marsupial plates short and narrow, with only ten long setæ set round the lower part. The first joint longer than the third, with a small expansion confined to the upper part just below the side-plate, spined along both margins; the

second joint with spines in front; the third equal in length to the next two united, spined along both margins; the fourth longer than the fifth, with a few spines on the margins; the fifth shorter than in the preceding peræopods, but otherwise similar, facing backwards not forwards.

Fourth Peræopods.—Side-plates like those of the preceding segment, but considerably smaller. Branchial vesicles shorter than the first joint. Limb differing but little from the preceding pair; the first and third joints rather longer, the expansion of the first a little slighter; the spines on the front margin of the third, fourth, and fifth joints more pronounced.

Fifth Peræopods.—Side-plates smaller than those preceding them, but similar. Branchial vesicles smaller than the preceding pair. First joint very slightly expanded behind close to the base, the whole of the hind margin fringed with strong spines alternating in length, the joint much exceeding the length of the third joint, instead of being subequal to it as in the preceding pair; the third joint shorter than in the preceding pair; the limb otherwise similar.

Pleopods.—Coupling spines slender, with three or four retroverted teeth. Cleft spines three in number on the first two pairs, on the third pair only two; joints of the rami numbering seventeen to eighteen.

Uropods.—Peduncles of the first pair shorter than the rami; outer ramus a little longer than the inner, both with the margins fringed and the apices tipped with spines; peduncles of the second pair shorter than the rami, which are armed like the preceding pair, the outer rather shorter than the inner; peduncles of the third pair much shorter than the rami; the rami lanceolate, spined on both margins, the inner longer than the outer, reaching rather further back than the first pair, which reach much further back than the second.

Telson elongate, cleft nearly to the base, reaching far beyond the peduncles of the third uropods, a little dehiscent near the sharp spine-tipped apices, each plate bordered on the outer margin with six or seven spines, and much resembling the adjacent rami of the uropods.

Length.—The specimen, in the position figured, measured, from the front of the head to the back of the second pleon-segment, a fifth of an inch.

Locality.—Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. One specimen, female. Dredged (type-specimen).

Station 149D, Royal Sound, Kerguelen, January 20, 1874; depth, 28 fathoms; bottom, volcanic mud. Two smaller specimens. Dredged.

Remarks.—The specific name is taken from the place of capture.

In describing the subfamily Dexaminæ, to which he assigns his genus *Tritæta*,

Boeck says that the palp of the first maxillæ has but one joint, armed on the left maxilla with teeth, on the right with spines, and that the palp of the maxillipeds is devoid of the last unguiform joint; in describing the genus *Tritæta*, he says that the outer plates of the maxillipeds are armed with few but strong spines, and only on the upper half; in the present species it will have been noticed that the palp of the first maxillæ is two-jointed (though the first joint is rather obscure), and that it has spines, not teeth, on the apex both in the left and right maxilla; also that the maxillipeds have many small teeth along the greater part of the inner margin, and that the palp has a fourth unguiform joint. Notwithstanding these differences there can be no question of separating the present species from the genus *Tritæta;* the spelling of the name is not easy to explain, since Boeck himself derives it from *τριταία*, though he invariably spells it *Tritæta*.

From *Polycheria tenuipes*, Haswell, *Polycheria brevicornis*, Haswell, *Polycheria obtusa*, G. M. Thomson, which, as observed above, all belong to this genus, and are all possibly synonyms of *Tritæta antarctica*, Stebbing, the present species is at once distinguished by the very different side-plates. Haswell figures the maxillipeds of *Tritæta tenuipes* with a three-jointed palp; the palp is also, I think, three-jointed in *Tritæta dolichonyx*, Nebeski, unless the fourth joint be represented by one of the numerous spines at the apex of the third joint.

Genus *Dexamine*, Leach, 1814.

1814. *Dexamine*, Leach, Edinburgh Encyclopædia, Crustaceology, Appendix, p 432.
1815. „ Leach, The Zoological Miscellany, vol. ii. p. 23.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii. p. 359.
1816. „ Leach, Encycl. Britannica, Annulosa, p. 425.
1825. „ Desmarest, Consid. gén. sur la classe des Crustacés, p. 263.
1840. *Acanthonotus* (*pars*), Milne-Edwards, Hist. Nat. des Crustacés, tome iii. p. 25.
1851. *Dexamine*, Costa, in Hope's Catal dei Crost. Ital., p. 23.
1851. *Amphithonotus*, Costa, in Hope's Catal. dei Crost. Ital., pp. 24, 45.
1853. „ Costa, Rend. della Soc. r. Borb.
1857. *Dexamine*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 10 (sep. copy).
1857. *Amphithonotus*, Costa, Ricerche sui Crost. Amf. Nap., pp. 175, 195.
1857. *Dexamine*, White, Popular Hist. of British Crustacea, p. 177.
1859. „ Bruzelius, Skand. Amph. Gamm., p. 78.[1]
1860. „ Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 658.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 130.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 236.
1864. „ Grube, Beschreibungen einiger Amph. der istrischen Fauna, p. 195.
1865. „ Lilljeborg, On the Lysianassa magellanica, p. 18.
1866. „ Heller, Beiträge zur näheren Kenntniss der Amph. des Adriat. Meeres, p. 30.
1868. „ Czerniavski, Materialia ad Zoographiam Ponticam comparatam, p. 111.

[1] Bruzelius, *loc. cit.*, p. 79, refers to Montagu's species as "*Gammarus speciosus*" instead of *Gammarus spinosus*.

1870. *Dexamine*, Boeck, Crust. amph. bor. et arct., p. 106.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 311.
1877. „ Stalio, Catal. Crost. dell' Adriatico, p. 181.
1878. „ Spence Bate, The Crustacea in Couch's Cornish Fauna revised and added to, p. 50.
1879. „ Thomson, Trans. New Zealand Inst., vol. xi. p. 237.
1880. „ Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 34.
1884. „ Blanc, Die Amphipoden der Kieler Bucht, pp. 51, 64.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 404.
1885. *Amphitonotus* (*pars*), Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 407.
1885. *Dexamine*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. p. 8 (sep. copy).
1885. „ Schneider, Pontocrates norvegicus, Boeck, and Dexamine thea, Boeck, p. 20.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 508.

For the original definition of the genus, see Note on Leach, 1814 (p. 86). That this genus appears first in the Appendix to Leach's article Crustaceology is clearly due to the fact that the type species, Montagu's "*Cancer Gammarus spinosus*," 1813, was not available when the article was originally written or printed, a fact which corroborates the date 1813 for the article itself. Dana in 1852 (U.S. Explor. Exped., vol. xiii. pt. ii. p. 910, note) was inclined to include *Dexamine* in what he supposed to be Rathke's genus *Iphimedia*. Sars in 1882 (Oversigt af Norges Crustaceer, p. 26) places *Dexamine*, in the family Atylidæ, between *Lampra* [*Tritæta*], Boeck, and *Atylus*, Leach. Schneider in 1885 inclines to uphold Boeck's "Dexaminæ" as a family, for the two genera which Boeck assigns to the group. Boeck's definition of the genus is as follows:—

"*Maxillipeds* having the inner margin of the outer plate armed with spines; the inner plate carrying on the apex a few slender setæ.

"Side-plates large, rounded on the lower margin; the four front pairs much deeper than the fifth.

"*Upper Antennæ* longer than the lower.

"*Peræopods* all with the fourth and fifth joints elongate; the finger long, slightly curved."

Dexamine flindersi, n. sp. (Pl. CXXXVII. C).

Rostrum acute, small but clearly defined; the lateral lobes of the head convex, not projecting quite so far as the rostrum.

Eyes situated on the lateral lobes, having numerous small ocelli.

Upper Antennæ.—The first joint rather thick, about once and a third as long as broad, with a few spinules and cilia on the lower and apical margins; the second joint about once and a half as long as the first, with a slender spine high up on the under margin, below which the joint becomes thinner and carries a few spinules; the third joint more than a third the length of the second, much thinner, a little longer than the

first joint of the flagellum but resembling it in general appearance; the flagellum longer than the peduncle, consisting of twelve joints of various lengths, and, except the two end ones, all nearly of the same thickness.

Lower Antennæ shorter than the upper. The first three joints short, the gland-cone small but prominent; the fourth joint rather shorter than the second of the upper antennæ, narrowing a little distally, carrying two or three small spines; the fifth joint a good deal shorter and narrower than the fourth, widening distally, having a spine at the apex of each margin, and a small one in the middle of the upper margin; the flagellum shorter than the peduncle, tapering, of five unequal joints, the first longer than the second and third united, the fourth longer than either of them separately.

Upper Lip.—The distal margin convex, the central part with minute cilia, longer ones on either side of the centre pointing inwards as usual.

Mandibles.—The cutting edge divided into seven unequal teeth, the secondary plate into four short teeth in a row with a slender spine-like tooth facing them on the left mandible, into four irregularly grouped on the right mandible; the spine-row consisting on the left mandible of three, on the right of two, denticulate or plumose spines; on the right mandible the molar tubercle with the dentate crown irregularly four-sided; on the left mandible the molar tubercle presenting a rather flattened appearance, with eight or nine rather strong but irregular teeth round part of the margin; palp wanting.

First Maxillæ.—The spines on the outer plate seem to be eleven in number, with lateral denticles to the number of three or four on some of them; the first joint of the palp short, the second tolerably long but not reaching beyond the outer plates, carrying on the narrow apex two long uneven setiform spines.

Second Maxillæ.—The outer plate has two spines placed apart on the outer margin, as well as many on the apical margin.

Maxillipeds.—The inner plates, so far as could be made out, are very small, not reaching so far as the distal end of the palp's first joint; the outer plates very large, completely covering the palp, the inner margins smooth and not dehiscent for a considerable distance; on the distal half there are three small spines which closely interlock with those opposite; these are followed by a row of three or four stout spine-teeth, which also interlock, the margins then becoming dehiscent, serrate, with five long curved spines on each; the outer margins are convex, the greatest breadth of the plates nearer the distal end than the base; the first joint of the palp is short, carrying a long spine; the second joint with some long spines on the inner margin, chiefly on the distal half; the third joint about as long as the first, with some spines on the distal half of the inner, and on the apex of the outer, margin; the finger much shorter than the third joint, with a small nail, and a setule at the base of the nail. The palps, as shown in the figure *mxp.*, were seen through the partially transparent outer plates.

First Gnathopods.—The side-plates much deeper than broad, the front and lower

margins being serrate or indented, the notches armed with spinules; the hind margin is nearly straight, a little bent in near the centre. The first joint reaches beyond the side-plate, is curved, and distally widened, the front margin concave, the hinder convex; the second and third joints are short; the wrist is triangular, shorter than the hand, longer than broad, with long spines at the apex of the hind margin as well as some higher up; the hand at its base is almost as wide as the wrist, and widens towards the palm, which is very slightly convex, making something more than a right angle with the hind margin, and something less than a right angle with the front; a row of four palmar spines is planted on the surface near the point where the palm begins; the finger is gently curved, nowhere very broad, the edges smooth, but with a dorsal cilium near the base, and a decurrent tooth formed by the inner margin near the base of the small acute nail, which seems to reach beyond the palm.

Second Gnathopods.—The side-plates rather larger than the preceding pair, the front margin more convex, smooth, the lower margin narrow, indented, carrying three or four spinules, the hind margin nearly straight. The limb very similar to the preceding, but with the first joint longer and more curved; the straight hind margin of the hand has two spines; the palm-margin is finely pectinate and fringed with spinules; but probably all these particulars apply also to the hand of the first gnathopods; the finger fits the palm.

First Peræopods.—The side-plates rather larger than the preceding pair, with the lower margin oblique, armed like the others. The branchial vesicles not quite as long or wide as the side-plate. The first joint attached a little above the middle of the side-plate and reaching a little below it, curved, widening a little distally, the hind margin convex, with one or two spinules, the front margin concave, with a spine at the apex. The second joint short, with a little spine on the hinder apex; the third joint a little longer and broader than the fourth, each with a spine near the middle of the hind margin and two or three at its apex; the fifth joint rather longer than the third, with spines at three points of the hind margin, and a couple of setules on the front; the finger three-quarters the length of the fifth joint, straight, except at the nail, with a small dorsal cilium near its base, and another at the base of the nail.

Second Peræopods.—The side-plates broader than the preceding pair, with five spinules on the nearly straight, slightly oblique lower margin, and one on the hind margin. The first two joints as in the preceding pair. The rest missing.

Third Peræopods.—The side-plates with convex front margin, produced below in a little lobe almost to the depth of the preceding plates, the lower margin beyond the lobe nearly straight and parallel with the upper, carrying spinules, the hind margin nearly straight, with one spinule near the rounded lower corner; these plates are much broader and not much less deep than the preceding pair. The branchial vesicles somewhat pear-shaped. The limb missing.

Fourth Peræopods.—The side-plates much smaller than the preceding pair, unequally bilobed.

The Fifth Peræopods and all the pleon were missing.

The minute fragment of which this specimen consisted was not measured before dissection, as from its condition it did not seem suitable for description. But as eventually it proved to be the only representative of the genus *Dexamine*, Leach, in the collection, it seemed worth while to take note of it, if only for the sake of the maxillipeds, and these are of interest, even if the reference to *Dexamine* should have to be set aside when the undescribed portions of the animal become known. The palp of the first maxillæ certainly appears to be two-jointed, which is contrary to the character assigned by Boeck to the genera *Dexamine* and *Tritæta*.

Locality.—Station 186, Flinders Passage, September 8, 1874; depth, 8 fathoms; bottom, coral mud.

Remark.—The specific name refers to the place of capture.

Genus *Stenopleura*, n. gen.

Mandibles with multidentate cutting plate, secondary plate on the left mandible, strong molar tubercle; palp robust, its second and third joints subequal in length.

First Maxillæ with the inner plate small, carrying one plumose seta on the apex.

Inner plate of the *Second Maxillæ* shorter, scarcely broader than the outer.

Maxillipeds with the inner plate not reaching beyond the base, the outer not beyond the apex, of the first joint of the palp; the palp's last joint long and sharp.

The Antennæ with short peduncles and long flagella, the upper longer than the lower.

The side-plates all shallow, the fifth as deep as the fourth.

The two pairs of *Gnathopods* alike, subequal, the hand as long as the first joint.

The first and third joints of the *First* and *Second Peræopods* not slender.

The first two pairs of *Uropods* with the outer rami much shorter than the inner; the third pair with short peduncles, long rami; the outer rather shorter than the inner.

Telson undivided, with sculptured end, not shorter than the third peduncles of the third uropods.

The generic name is derived from στενός, narrow, and πλευρά, side, in allusion to the shallow side-plates. The genus appears to be inosculant between the Atylidæ and Eusiridæ.

Stenopleura atlantica, n. sp. (Pl. LXXXIV.).

Rostrum inconspicuous, lateral lobes of the head small, somewhat pointed; the postero-lateral angles of the first three pleon-segments not drawn out to a point; the fourth pleon-segment with a dorsal depression.

Eyes high up on the sides of the head, longer than broad, large, with numerous very small ocelli.

Upper Antennæ.—The peduncle short, about as long as the head, the second joint thinner and shorter than the first, the third than the second; the flagellum of thirty-three joints, the first much longer than the third joint of the peduncle, carrying some cylinders, the next twelve joints short, not thick, the remainder again longer, filiform.

Lower Antennæ.—The first three joints of the peduncle very short, the first a little expanded, gland-cone inconspicuous; the fourth joint longer than the preceding three united; the fifth shorter and thinner than the fourth, like it having groups of cilia or setules along the upper margin; flagellum filiform, of thirty-five joints.

Mandibles.—Cutting plate short, with widened distal margin, not curved downwards, divided into nine teeth, of which the lowest three are the largest, the lowest but two larger than the others; the secondary plate on the left mandible also short and broad, distally divided into eight teeth, none large, the lowest larger than the rest; on the right mandible no secondary plate could be clearly made out; spine-row of three strong, not smooth spines, amidst a row of cilia; on the right mandible there were only two strong spines, a difference in number which, as well as the apparent absence of a secondary plate, might possibly be due to accident, but the same difference in the number of spines of the spine-row was observed in *Dexamine flindersi*, and is noticed by Schneider in *Dexamine thea*, Boeck; the molar tubercle with twelve or thirteen rows of rather strong denticles; the first joint of the palp short, with a narrow base; the second joint large, narrowest at either end, hind margin a little concave, front very convex, with five or six slightly plumose spines along its course; the third joint much thinner than the second, but of about the same length, with five or six spines on the front margin, three at the apex, one on the surface behind near the base, and many adpressed cilia on the surface near the apex and near the front margin, beyond which some of them project.

First Maxillæ.—Inner plate small, with a single plumose seta on the middle of the rounded apex; the outer plate with a small tuft of cilia at the distal end of the inner margin, the truncate distal margin carrying ten spines in two rows, five long and slender, minutely denticulate, in one row, in the other four that are shorter, but one that is long and stout, this being the next to the outermost; the spines in this second row appear to have but a single denticle or none; the second joint of the palp is long, overtopping the outer plate, with five slender spine-teeth, serrate on both edges, set

in the dentate distal margin; three of the spines are on the inward slope of the margin, with two short setæ on the surface near them, the remaining two on the outward slope, the apical point between being rounded, hairy or minutely serrate.

Second Maxillæ.—Inner plate shorter than the outer; eight or nine spines on the slightly oblique distal margin of each.

Maxillipeds.—Inner plates scarcely reaching beyond the base of the first joint of the palp, the distal margin sloping outwards, and armed on its outer part with two or three incurving spines; the outer plates not reaching beyond the distal end of the first joint of the palp, the inner margin unarmed, except for a few setæ which arise on the surface near it; round the distal border there are four curved spines or setæ, the hindmost the longest; first joint of the palp short, the second the longest, widening distally, with some spines of various lengths, not numerous, on the inner border; third joint rather longer than the first; finger as long as the third joint, with a sharp curved nail, and some cilia near the base of it.

First Gnathopods.—Side-plates very small, almost triangular, projecting the apex forwards. The first joint reaching much below the side-plate, rather shorter than the hand, the hind margin convex, the front nearly straight; the third joint almost without free front margin, with setæ or spines at two points on the hind margin, distal edge somewhat squared; the wrist much shorter than the hand, triangular, cup-shaped, very slightly produced behind, with groups of serrate spines at the apex and two other points of the hind margin; the hand oval, with the broader end at the base, the hind margin at intervals carrying spines of various lengths, none so powerful as the largest of those on the wrist; the front margin has a setule at the apex, and another at some distance from it; the finger is long and curved, probably antagonising with the strong spines of the wrist, as there appears to be no defined palmar margin on the hand; the nail is long and sharp, with a small cilium at its base; the dorsal cilium near the hinge of the finger is very small.

Second Gnathopods.—Side-plates a little larger and more squared than the preceding pair. Branchial vesicles scarcely so long as the first joint of the limb. The limb in general resembling the first gnathopods; the first joint a little longer and thicker, with some setæ on the hind margin near, as well as at, the apex; the other joints also slightly larger.

First Peræopods.—Side-plates very small and shallow, the short front margin almost straight, the longer lower margin convex. The branchial vesicles irregularly oval, the hind margin sinuous, rather longer than the first joint of the limb. The first joint extending much below the side-plate, broad except at the base, not twice as long as broad, front margin nearly straight, with one or two seta-like spines near the top, hind margin convex, with spines at the apex; second joint short; third shorter than the fourth or fifth, but broader, its hind margin straight, with two sets of spines, the front margin very

much bowed, with a couple of small spines at the apex, and another a little higher up; the fourth joint rather shorter than the fifth, slender, a little curved, with spines at four points of the hind margin; fifth joint as long as the first, slender, a little curved, with spines at three points of the hind margin; finger slender, much curved, acute.

Second Peræopods.—Side-plates like the preceding pair, but larger. Branchial vesicles considerably longer than the first joint of the limb, of nearly even width throughout, the margins irregular; the first joint extending less beyond the side-plate, because of the greater size of that plate; the limb scarcely distinguishable from that of the preceding pair except that the joints from the third to the sixth are rather longer.

Third Peræopods.—Side-plates bilobed, broader, and at the hinder lobe deeper, than the preceding pair. Branchial vesicles longer than the first joint of the limb. The first joint a broad oblong-oval, rather longer than the first joint in the preceding pair, with small spines at two points on the front margin and at its apex, and one or two spinules on the hind margin; second joint short, with its hind lobe not decurrent but pointing downwards; third joint shorter than the first, the breadth about half the width, spines at two points on the straight front margin and at its apex, and with a similar distribution on the convex hind margin; the rest of the limb missing. In a second mounted specimen the peræopods were all broken at the third joint, but the fragments indicated that the third and fifth pairs were probably similar to the fourth, the third shorter, the fifth longer.

Fourth Peræopods.—Side-plates with a decurrent hind lobe. Branchial vesicles scarcely so long as the first joint. First joint longer and broader than in the preceding pair, wider above than below; third joint longer than in the preceding pair, as long as the first joint, the breadth one-third of the length, spines at four points on each margin; the fourth joint a little longer than the third, slender, slightly curved, with spines at four points in front and two behind; fifth joint much longer than the fourth, slender, a little curved, with spines at five points on the front margin, some spinules at four or five points behind, the distal end rounded below the apical spines of the front margin; finger slender, sharp, curved, with some minute cilia on the inner margin.

Fifth Peræopods.—Side-plates small, not decurrent, the hind margin nearly straight. Branchial vesicles very small. First joint much larger than in the preceding pair, the hind margin nearly straight, much longer than the front, so that it descends below the second joint, having a little incision at the lower corner with a small cilium in it; there are spines at the apex of the front margin and at two points above it; the third joint nearly as long as the first, with spines at four points on the front, and five on the hind, margin; its breadth not a third of its length; the rest of the limb missing.

Pleopods.—Coupling spines very small, with four or five small teeth; cleft spines few in number, apparently only two, with long arms, the inner nearly as long as the

outer; joints of the rami numbering from thirteen to fifteen, on the last pair twelve and fourteen.

Uropods.—Peduncles of the first pair subequal in length to the longer inner ramus; the outer ramus much shorter than the inner, both carrying numerous spines along the margins, and a group containing one long one at the apex; peduncles of the second pair much shorter than the outer, a little longer than the inner ramus; the rami armed as in the preceding pair; peduncles of the third pair very much shorter than the long, broad, sharply pointed, much spined inner ramus; the outer ramus missing in this specimen, in another seen to be rather shorter and more slender than the inner; the peduncles of the first and third pairs reach slightly beyond those of the second pair, the inner ramus of the third a little beyond the inner of the first, which again reaches a little beyond the inner of the second; all are minutely pectinate on the edges. By an accidental twisting of the third uropods the inner ramus in the figure *ur.*3 has the appearance of being the outer.

Telson a little longer than the peduncles of the third uropods, reaching back equally far; longer than broad, with a triangular slightly serrate tip, the converging lateral margins forming small apices on either side less far back than the central and larger apex.

Length.—The specimen, in the position figured, measured, without the antennæ, three-tenths of an inch.

Locality.—The specimen figured was labelled as obtained on the 25th of August, 1873, in Mid Atlantic, whether at the surface or from any depth was not stated. Corresponding to this date is Station 106; lat. 1° 47′ N., long. 24° 26′ W.; depth, 1850 fathoms; bottom, Globigerina ooze; bottom temperature, 36°·6.

A second specimen, a female with eggs, mounted in Canada balsam during the voyage, was labelled as taken in the "South Atlantic, 11. 10. 73," lat. 35° 41′ S., long. 20° 55′ W., belonging therefore to the neighbourhood of Tristan da Cunha.

Remarks.—I believe that the specimen from Station 106 is a female, as there were eggs apparently belonging to this specimen, but I did not discover any marsupial plates or other decisive indications of sex, so that the point is doubtful. The specific name refers to the place of capture.

Family Eusiridæ.

Upper Lip distally symmetrical, or nearly so.

Mandibles with the cutting plate broad, dentate; the secondary plate on the right mandible less powerful than that on the left; the molar tubercle either weak or strong; the third joint of the palp elongate.

Maxillipeds with the inner and outer plates well developed, but small in comparison with the elongate palp.

Lower Antennæ with the peduncle elongate.

First and *Second Gnathopods* alike in form, the wrist cup-like, the hand ovate, robust.

Uropods biramous; in the first and second pairs the outer ramus generally shorter than the inner.

Telson elongate, more or less cleft, but sometimes to a very small depth.

The first pair of side-plates larger than the second.

Genus *Rhachotropis*, S. I. Smith, 1883.

1883. *Rhachotropis*, Smith, Proc. U.S. Nat. Mus., pp. 222, 229.
1884. *Tritropis*, Schneider, Crust. og Pycn. Kvænangsfjorden, p. 108.
1887. „ Hansen, Oversigt over de paa Dijmphna-Togtet inds. Krebsdyr.

S. I. Smith in 1883 substituted the name *Rhachotropis* for Boeck's *Tritropis*, that being preoccupied, but gave no fresh definition of the genus. Carus in 1885 makes *Tritropis*, Boeck, a synonym of "*Amphitonotus*, Costa," but of the three species he places under the genus so named one belongs to *Dexamine*, a second to *Atylus*, and the third is undescribed. For what may be regarded as the original definition of *Rhachotropis*, see Note on Boeck, 1870 (p. 400), genus *Tritropis*.

Rhachotropis aculeatus (Lepechin).

1780. *Oniscus aculeatus*, Lepechin, Acta Petrop., p. 247, tab. 8, fig. 1.
1824. *Talitrus Edvardsii*, Sabine, Appendix to Parry's Voyage of Discovery, p. 232, pl. ii. figs. 1–4.
1826. „ „ Ross, Appendix to Parry's Third Voyage, p. 119.
1828. „ „ Ross, App. to Narr. of an attempt to reach the North Pole, No. 15.
1835. *Amphithoë edvardsi*, Owen, Appendix to the Narr. of a Second Voy. in search of a North-west Passage, p. 90.
1846. „ *Edwardsii*, Krøyer, Naturh. Tidsskr., R. 2, Bd. ii. p. 76.
1862. *Amphithonotus Edwardsii*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 151, pl. xxviii. fig. 5.
1865. „ *aculeatus*, Goës, Crust. amph. maris Spetsb., p. 10.
1867. *Amphitonotus Edwardsii*, Packard, Mem. Bost. Soc. Nat. Hist., vol. i. p. 297.
1870. *Tritropis aculeata*, Boeck, Crust. amph. bor. et arct., p. 78.
1870. „ *Helleri*, Boeck, Crust. amph. bor. et arct., p. 79.
1874. *Amphithonotus aculeatus*, Buchholz, Die zweite Deutsche Nordpolarfahrt, ii. p. 316, Taf. iv.
1876. *Tritropis aculeata*, Boeck, De Skand. og Arkt. Amph., p. 511.
1876. „ *Helleri*, Boeck, De Skand. og Arkt. Amph., p. 513.
1883. *Rhachotropis aculeata*, S. I. Smith, Proc. U.S. Nat. Mus., pp. 222, 229.

According to Buchholz, who has given figures and a description, which clearly agree with the Challenger specimens, the form which Boeck has named *Tritropis helleri* is only the young of the older species, the absence of the carina from the earlier segments of the

peræon being a characteristic of youth and not of species. A specimen measuring, without the antennæ, more than three-quarters of an inch, had no trace of a carina on the first five segments of the peræon.

Locality.—Station 49, south of Halifax, Nova Scotia, May 20, 1873; lat. 43° 3′ N., long. 63° 39′ W.; depth, 85 fathoms; bottom, gravel, stones; bottom temperature, 35°. Thirteen specimens. Dredged.

Rhachotropis kergueleni, n. sp. (Pl. LXXXV.).

The Rostrum very long and narrow, depressed between the upper antennæ; the lateral lobes of the head narrow, prominent; segments of the peræon very short; the first four segments of the pleon long, carinate, dorsally produced into a small sharp tooth, that on the second segment the largest; on the first and second segments there is an additional less prominent denticle on either side of the central one; the postero-lateral angles of the first three pleon-segments are not acute or produced; in the third segment the lower margin is straight, with several small submarginal spines, the lower lobe of the hind margin is cut into fifteen upward turned teeth.

Eyes not perceived.

Upper Antennæ.—First and second joints long, subequal in length, the first thicker than the second, carrying some long plumose cilia; the second joint having many setules on the upper and some spinules on the lower margin, and an apical feathered cilium; the third joint not a third of the length of the second; the flagellum much longer than the peduncle, of thirty-four joints, those of the distal half being very slender.

Lower Antennæ.—The first three joints very short, the gland-cone short, decurrent; the fourth joint much longer than the preceding three united, longer than the first joint of the upper antennæ, fringed above with setules, below with spinules and long plumose cilia; the fifth joint much longer than the fourth, nearly as long as the peduncle of the upper antennæ, fringed above with setules, and having a few spinules on the lower margin; the flagellum very slender, longer than the peduncle, abruptly narrower, of thirty-seven joints, all slender, the first cleft at the base within the socket.

Upper Lip.—The distal margin a little flattened, very slightly ciliated.

Mandibles.—The cutting plate is narrow, with a small denticle at the top, the lower end bidentate, although scarcely so in the left mandible of the specimen examined, perhaps through its being worn down by use; the secondary plate of the left mandible with the edge cut into six small teeth; the secondary plate on the right mandible is narrow, with a very irregular edge, perhaps regularly dentate in unworn specimens; there are two spines in the spine-row, of which, however, on the left mandible only the stumps remained; the molar tubercle small, its dentate crown roundly oval, fringed with strong sharp teeth, with rows of smaller denticles on the inner side, which do not appear

to cross the hollow centre of the crown; there is a short seta accompanied by some cilia; the palp is of great size, the first joint short, the second long and broad, with about a dozen spines of various lengths on and near the inner margin; the third joint longer than the second, with the concave inner margin fringed for most of its length densely with spines, those about the narrow apex being more obviously pectinate than the rest; the convex outer margin shows no spines.

Lower Lip.—The principal lobes distally rounded and ciliated, rather widely dehiscent, the inner margins also ciliated; the mandibular processes very short.

First Maxillæ.—The inner plate comparatively long, with a short setule and a plumose seta on the inner side of the rounded apex; of the nine spines on the truncate distal margin of the outer plate five are long, and all except the outermost have five or six lateral denticles; the other four are shorter, and have a single lateral tooth, unless this be wanting on the outermost; the second joint of the palp is very long, much overtopping the outer plate, it is strongly ciliated, and has several long setæ near the apex and some long spines upon it.

Second Maxillæ.—The inner plate with the inner margin slightly concave, the outer very convex, spines round the narrowed apex, and a very little way down the inner margin; the outer plate of more even breadth, not so broad as the greatest breadth of the inner plate; the spines on the narrowed apex and a little way down the inner margin much larger than those of the inner plate.

Maxillipeds.—The inner plates not reaching far along the first joint of the palp; the broad distal margin has three spine-teeth set close together on the inner part, and three curved spines on the serrate outer part; the outer plates are narrow, not reaching the middle of the second joint of the palp; about twenty long spines arm the inner margin, and five still longer ones pass round the narrow apex down the upper part of the convex outer margin; the first joint of the palp is short, with a couple of spines on the outer margin just below the apex, and a small one lower down; the second joint is elongate, not broad, with several spines on the inner surface and along the inner margin; the third joint is long, shorter than the second, longer than the first, with many spines of various sizes, some pectinate, along both margins and on the surface; the finger is long and slender, much curved, and sharply pointed. About the mouth-organs and other parts of this creature there are many conspicuous oval parasites.

First Gnathopods.—Side-plates narrow and tongue-like, directed towards the base of the lower antennæ. The first joint reaching much below the side-plate, proximally very narrow, then widening, concave, and channelled in front, with spines near the apex, the hind margin convex, with some small submarginal and one or two apical spines; the second joint short, with an apical spine; the third joint longer than broad, with two groups of spines on the hind margin, and a larger group on the squared apical border; the wrist short, cup-like, with a small calx, having the hind margin serrate, the apex

dentate, both set with groups of spines, which, as in the preceding and following joints, are pectinate; on the inner surface there are five spines of very unequal lengths; the hand is large, oval, narrowest distally, the long front margin smooth except for the apical spines, one of which is pectinate, the hind margin almost absorbed by the long convex palm, which is defined by a row of five strong palmar spines on the inner surface, and three on the margin; of the five the outermost is the longest, of the three the lowest; the palm-border is striated as in the genus *Eusiroides*, and crowded with submarginal pectinate spines or spinules of various lengths; there are also scattered spines or groups of spines on both surfaces. The long curved finger closes over the whole palm, the inner margin smooth, probably channelled.

Second Gnathopods.—Side-plates small, rather broader than the preceding pair, with convex lower margin, not produced forwards. The branchial vesicles narrow, not so long as the first joint. The limb scarcely differing from that of the first gnathopods, except that the third joint, the process of the wrist, the hand, and the finger are rather longer.

First Peræopods very slender, as are all the peræopods. Side-plates like the preceding pair. Branchial vesicles longer than the preceding pair, widening a little near the distal end, as long as the first joint. First joint evenly narrow, with some small spines along the front margin and at the hinder apex; the second joint very short, with a spinule on the hind margin and spines at its apex; the third joint not quite two-fifths the length of the first, not decurrent in front, with small spines on the hind margin at five points; the remainder of the limb missing.

Second Peræopods.—Side-plates broader than the preceding pair, excavate behind to some depth, the lower margin straight, with a small tooth where it meets the curve of the hind margin. The branchial vesicles like the preceding pair. The limb defective as in the first peræopods; no spinule on the hind margin of the second joint.

Third Peræopods.—Side-plates as broad and not much less deep than the preceding pair, the front lobe rounded, the hinder more shallow and a little serrate. The branchial vesicles nearly as in the preceding pair, but a little more regularly oval. The first joint of the limb very small, the front margin very slightly convex, with one or two spinules, the hind margin toothed for four spines, apically acute, the lower margin with a small rounded lobe in front, the hinder part straight; the second joint very short, unarmed; the third joint long and slender, three times as long as the first, slightly curved, with small spines along the margins, the apex sharply decurrent behind, and carrying two larger spines. The rest of the limb missing.

Fourth Peræopods.—The side-plates with a hind lobe produced downwards, its lower corner serrate. Branchial vesicles smaller than the preceding pair. First joint similar in shape to that of the third peræopods, rather larger, with a few spines along

the front margin, and five in the notches of the hind margin; the third joint two and a half times the length of the first, with many spines along the margins, two on the slightly concave front margin being long like those at the apex; the fourth joint rather shorter, the fifth much longer than the third, both very slender and carrying numerous spines on both margins; the finger missing.

Fifth Peræopods.—The side-plates as broad as those of the third peræopods, the lower margin somewhat lobed in front. The branchial vesicles very small. The first joint of the limb much larger than in the preceding pair, with several small spines on the nearly straight front margin, and nine small ones in the serrations of the convex hind margin; the third joint longer and stouter than that of the fourth peræopods, similar in shape, carrying many spines, its length double of the first joint. The remainder of the limb missing.

Pleopods.—Coupling spines small, with a single lateral retroverted tooth close to the apex; cleft spines six on the first pair, five on the second, three on the third pair, the arms long and very unequal; above the cleft spines are several plumose setæ; joints of the rami sixteen and nineteen in the first pair, eighteen and twenty-two in the two other pairs, the smaller number belonging to the inner ramus.

Uropods.—The peduncles of the first pair rather longer than the rami, with small spines along the margins; the rami slender, acute, nearly equal, the outer a little the shorter, both with a few marginal spines; the peduncles of the second pair longer than the outer, shorter than the inner ramus, with spines on the outer margin and at the acute apex of the inner; the rami have few marginal spines; the peduncles of the third pair much shorter than the rami, reaching back a little beyond those of the two preceding pairs, having some spines on both margins, those on the inner very slender, except one that lies beside the very acute apex; the rami broad and long, nearly equal, the outer rather shorter than the inner, both with numerous marginal spines, and both narrowing rather abruptly to the acute apex.

The Telson long and narrow, reaching nearly to the apices of the rami of the third uropods; the greatest breadth not one-third of the length, the sides converging very slightly till near the apex, which is almost acute, although divided by a very short slightly dehiscent slit; the surface carries many spinules at a little distance from the lateral margins, and near the top of each of these margins a long feathered cilium or seta with a short spine beside it; the margins show some pectination especially near the apex.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the apex of the third uropods, nine-twentieths of an inch.

Locality.—Two specimens were obtained at Kerguelen; depth not specified.

Remarks.—The specific name refers to the place of capture.

Genus *Cleonardo*, n. gen.

Near to *Rhachotropis*, S. I. Smith.

Antennæ subequal, the upper longer than the lower.

Upper Lip with the distal margin convex.

Palp of the *Mandibles* long and slender, the third joint longer than the second.

The outer plate of the *First Maxillæ* carrying eleven spines; the two-jointed palp very long.

The inner plate of the *Second Maxillæ* much broader than the outer.

The calx of the wrist in the two pairs of *Gnathopods* not much produced.

The Peræopods all very long and slender, especially the fingers, which have setæ on the outer margin.

The outer ramus shorter than the inner in each pair of *Uropods*.

The Telson long and deeply cleft.

The trunk without carina or processes.

The generic name is taken from a personal name in Don Quixote.

From the species that have been assigned to *Rhachotropis* (under the name *Tritropis*), the species on which the present genus is founded differs in some particulars not included in the generic character; thus the side-plates of the first four peræon-segments are not so small, nor is the first pair produced forwards; the third joint in the first and second pairs of peræopods is not short, but elongate, while it is comparatively short in the three following pairs.

Tritropis appendiculata, G. O. Sars,[1] must no doubt be referred to this genus. That species was obtained in the sea north-west of Finmark, at the depth of 1287 fathoms, at a station located in the cold area. In 1885 Sars remarks upon it, "the form treated of here exhibits in some respects a rather striking deviation from the other species referred to the genus *Tritropis*, and may possibly be found to constitute a separate genus."

Cleonardo longipes, n. sp. (Pl. LXXXVI.).

Rostrum short and broad but well pronounced, sides of the head with broadly rounded lobes. The skin microscopically furred.

Eyes not perceived.

Upper Antennæ.—First joint of the peduncle much stouter than the second, outdrawn below into a blunt point, tipped with one very short and one rather longer spine, and two feathered spine-like cilia; the second joint rather longer than the first, distally outdrawn to a point above and below, with feathered cilia preceding the outdrawn parts;

[1] Crust. et Pycnog. nova, No. 27, p. 451, 1879, and Den norske Nordhavs-Expedition, p. 194, pl. xvi. fig. 3, 1885.

third joint very short and (especially at the centre) narrow; there is a calceolus at the end of this, and two near the end of the preceding joint; flagellum stout, with forty-six joints, the first as long as five or six of the following, with three calceoli, the following joints having each one, till near the end, cylinders on several of the distal joints.

Lower Antennæ.—The basal portion of the composite first and second joints not much expanded below, the distal part concave above, with a small, not prominent, gland-cone below; the third joint short, with long, fine, feathered setæ at the apex; the fourth elongate, with distally feathered setæ and slender spines in groups along its inner margin; the fifth joint elongate, but shorter and much narrower than the fourth, with ten calceoli along it, and setæ as on the other joint; the flagellum slender, of about thirty-five joints, with calceoli on those of the upper half. The calceoli are large and striking, especially in the middle part of the flagellum of the upper antennæ; a short broad stalk supports an unusually large circular cup with radiate markings, from the centre of which, and connected with it at the back, rises the usual oval piece shaped like the bowl of a spoon, crossed by concentric lines, which are in this species very strongly marked.

Upper Lip.—The outer plate broadly rounded, the prominent convex central part of the distal margin fringed with small hairs and prickles; the sides, which are also convex, but somewhat drawn back from the centre, are as it were whiskered with long cilia directed towards the centre, an arched row of such cilia crossing the whole breadth of the plate.

Mandibles.—The cutting edge long, incurved, much down-drawn, ending below in two or three strong teeth; the secondary plate on the left mandible strong, bent so as to follow the curve of the principal plate, its long border divided into some eight strong teeth; the secondary plate on the right mandible small, narrow, with a long apical tooth below and one or more short ones above; the spine-row on the left mandible consisting of eight long spines with some cilia attending them; on the right mandible the spines in the spine-row appear to be fewer; the molar tubercle prominent, the roughly-oval dentate crown (as seen in the left mandible) set with some two dozen rows of denticles, and carrying a small plumose seta at the upper corner; there is a process between the molar tubercle and the palp; the first joint of the palp is concave on the inner side, the second joint long, abruptly narrowed on the inner side about midway, furnished with numerous setæ of different lengths, more or less feathered, along the inner margin, and a row which have their origin on the surface extending over more than the upper half; the third joint rather longer than the second, crowded with spines of different lengths, the longer ones pectinate, the longest at the apex differing from the others in having the apical third unpectinate.

Lower Lip.—The forward lobes, both inner and outer, rounded, rather strongly ciliated; the mandibular processes short.

First Maxillæ.—Inner plate oval, with one plumose seta on, and another a little below, the apex; outer plate not reaching much beyond the inner, with eleven slender spines on the moderately oblique apical margin, the innermost spine the longest, nearly straight, denticulate, the five following long, curved, with several lateral denticles, except the last, which has only two; on the inner row of five shorter spines each has two lateral denticles, except the central, which has only one; the palp reaching considerably beyond the outer plate, the first joint long, more than half the length of the second; the second joint carrying half-a-dozen seta-like spines on the inner margin near the top, four on the apex, and three at intervals on the hind margin.

Second Maxillæ.—The inner plate rather broader and very little shorter than the outer; the outer part of the apex unarmed, the remainder fringed with pectinate spines, of which the series descends the inner margin, closing with two long plumose setæ and three quite short simple ones; the outer plate having the apical and upper part of the inner margin fringed with curved, setiform spines, five short ones descending the outer margin.

Maxillipeds.—Inner plates not reaching the apex of the first joint of the palp, having three teeth on the apical margin, two close together, a seta intervening between them and the third, which is followed by three or four more setæ; a few setæ pass from the inner towards the centre of the apical margin; the outer plates not very broad, not nearly reaching to the apex of the second joint of the palp, with very numerous spines (not dentiform) along the inner margin, two at the apex longer than the others, and five or six long plumose setæ round the upper half of the outer margin; besides the spines there are on the surface within the inner margin setæ as stout as the spines, but longer; the second joint of the palp is much longer than the first, widening distally, provided with numerous long marginal setæ and a surface row near the apex; the third joint is longer than the first, crowded with setæ and spines of various sizes, many pectinate, some of those adjoining the finger straight, others curved; the finger a little curved at the tip, its inner edge prior to the tip being set with ten short setæ or seta-like spines.

First Gnathopods.—Side-plates short, bowed out in front, not much longer than broad, with a spine and some spinules on the upper part of the nearly straight hind margin. First joint reaching much beyond the side-plate, fringed in front with long setæ which start from the surface, and having two or three tufts on the hind margin; the second joint short, with an apical tuft behind; the third oblong, short, with setæ on the lower part of the hind margin and the squared apex; the wrist has three rows of setæ on the front margin, and seven or eight rows on the curved lobe behind, this lobe giving the wrist, seen from the outside, a cup-shaped appearance, whereas on the inner side it has a lozenge-like shape, the lower and hinder margins of the lozenge carrying setæ; the hand is broader at the base than the wrist, which it greatly exceeds in length and in size generally; the convex front margin carries several tufts of setæ of different

sizes; the hind margin, with two small tufts, extends but a short distance before forming a slightly recessed angle which marks the beginning of the long convex palm; in the recess is planted a group of spines, one of which is much longer than the rest, while recessed in the inner surface of the hand is a second neighbouring group of spines, seven in number, seemingly all of different lengths; the palm margin carries four spines distributed along the earlier part of its course, cilia of different lengths fringing it right up to the finger-joint; there are also some setæ projecting from the surface of the hand; the finger is slender, curved, and of great length in correspondence with the palm; it has some minute hairs on the inner margin.

Second Gnathopods.—Side-plates moderately broad in comparison with their length, not so broad as those of the preceding segment, with two or three spines on the straight hind margin, which is nearly parallel to the front one, lower margin convex. Branchial vesicles as long, but not so broad, as the side-plates. The limb strikingly resembles that of the first gnathopods, the joints being rather longer, and the hand a little more tapering, with the long palmar spine and the four marginal spines somewhat more pronounced.

First Peræopods.—Side-plates rather narrower than those of the preceding segment. Branchial vesicles small, oval. The whole limb very narrow and elongated; the first joint reaching much beyond the side-plate, with eight or nine rows of setæ near the convex front margin, the slightly concave hind margin fringed with setæ, more or less plumose, of different lengths, some of them very long; the second joint as usual short; the third shorter than the first, but very long, curved, and little produced below, with four very long thin setæ and some setules on the convex front margin, and a variety fringing the concave hinder margin; the fourth joint is shorter than the fifth, the fifth a little shorter than the third, but both are long and slender, nearly straight, with thin setæ and setules at various points; the finger is slender, very slightly curved, as long as the fifth joint, or a little longer, with a small dorsal cilium near the base, and at a short distance from the apex a row of three or four dorsal setæ, the tip forming a very thin nail with a cilium at its base. The finger in each of the peræopods of this species bears a similarity to the finger of the fifth peræopods in the Œdiceridæ.

Second Peræopods.—The side-plates not much longer than their greatest breadth, which is above the centre, the hind margin below the excavation running very obliquely forwards, with some slight serrations. The branchial vesicles not as long as the side-plates. The limb closely resembles the first peræopods.

Third Peræopods.—Side-plates small, bilobed, broader than the first joint of the limb, which is oval, but with the hind margin straightened, edged with spinules, the front margin carrying a couple of setules at the top, and small spines round the rest of its course; the second joint short, overlapped behind by the first; the third joint shorter than the first, a little longer than the fourth, narrowest at the base, and broadest

near it, a little decurrent behind, with spines on both margins, none of them strong; the fourth joint with four groups of spines on each margin; the fifth joint considerably longer than the third or fourth, with numerous spines on both margins, especially on the front; the finger very long and thin, longer than the third or fourth, subequal to the fifth joint, with a dorsal cilium and two dorsal setules, as in the preceding peræopods; which in all but the first joint it nearly resembles, but having the fifth and sixth joints much longer.

Fourth Peræopods.—Side-plates with the hinder lobe much larger than the front one. Branchial vesicles small, expanded below on either side of the narrow upper part. The limb nearly as in the preceding pair, rather longer in respect of the first and third joints, the first joint being a little more expanded above than below, while in the third peræopods the reverse is the case.

Fifth Peræopods.—Side-plates not bilobed, much deeper behind than in front. Branchial vesicles small. Limb similar to that in the two preceding pairs; first joint produced a little upwards in front, and considerably downwards behind, broader above than below; the third joint not longer than the fourth.

Pleopods.—The peduncles have a row of about a dozen setæ near the outer margin, and two groups near the top of the inner, and some also on the lower margin. The two coupling spines are very small and crooked, with only one lateral retroverted tooth, which is placed a long way below the terminal hook; there is a setule or small simple spine close by; the cleft spines appear to be six in number on the first and second, and five on the third pleopods, with an uncleft plumose seta above; the joints number twenty on the inner ramus to twenty-three on the outer.

Uropods.—The peduncles of the first pair longer than the rami; the rami stiliform, the inner somewhat longer than the outer, peduncles and rami bordered on the upper or inner margins with numerous spines and having their edges finely pectinate; the peduncles of the second pair equal in length to the inner ramus, which is broader and longer than the outer and more closely set with spines; peduncles and rami all fringed with spines and pectinate; peduncles of the third pair subequal in length to the outer ramus; rami broad, lanceolate, rather strongly serrate on the inner edges, the inner broader and considerably longer than the outer, with some plumose setæ besides its numerous spines; the peduncles with few spines, the rami with many, the edges of all pectinate.

Telson elongate, tapering, extending beyond the peduncles of the third uropods almost to the end of the rami, cleft for more than three-quarters of its length, not dehiscent, apices acute, all the margins except the basal finely pectinate, a couple of cilia not far from the base and outer margin on either side, and some others at other points, but scarcely perceptible even with a high power.

Length.—The specimen, in the position figured, measured, without the antennæ, two-fifths of an inch.

Locality.—Station 297, south-west of Juan Fernandez, November 11, 1875; lat. 37° 29′ S., long. 83° 7′ W.; depth, 1775 fathoms; bottom, Globigerina ooze; bottom temperature, 35°·5. One specimen, male (as shown by the appendages at the seventh segment of the peræon). Taken in the tow-net at the trawl.

Remark.—The specific name refers to the elongate character of the peræopods. There are many points of similarity between this species and its Arctic congener, in spite of the vast interval between the localities at which they were respectively met with.

Genus *Eusirus*, Krøyer, 1845.

1845. *Eusirus*, Krøyer, Naturh. Tidsskr., R. 2, Bd. i. p. 511.
1859. „ Bruzelius, Skand. Amph. Gamm., p. 63.
1860. „ Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 655.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 154.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 266.
1865. „ Lilljeborg, On the Lysianassa magellanica, p. 18.
1866. „ Heller, Beiträge zur näheren Kenntniss der Amph. des Adriat. Meeres, p. 32.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 281.
1870. „ Boeck, Crust. amph. bor. et arct., p. 76.
1873. „ C. W. Thomson, The Depths of the Sea, p. 125.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 500.
1880. „ G. M. Thomson, Ann. and Mag. Nat. Hist., ser. 5, vol. vi. p. 4.
1881. „ G. M. Thomson, Trans. New Zealand Inst., vol. xiii. p. 215.
1882. „ Haswell, Catal. Australian Crust., p. 246.
1882. „ Hoek, Die Crust. der Fahrten des "Willem Barents," p. 57.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 408.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 509.
1886. „ Perrier, Les Explorations sous-marines, p. 288.
1887. „ Hansen, Oversigt over de paa Dijmphna-Togtet inds. Krebsdyr.

For the original definition, see Note on Krøyer, 1845 (p. 213); Boeck gives the following:—

"*Mandibles* apically only a little dentate, the molar tubercle robust.

"*First Maxillæ* with the palp elongate, acuminate, setose, the first joint more than half the length of the second.

"*Upper Antennæ* longer than the *Lower*, the third joint of the peduncle very small, almost rudimentary; the accessory flagellum very little.

"*First* and *Second Gnathopods* with the hands alike in size and shape; the wrist elongate, with a spur behind (postice calcarato), narrow, and attached at the middle of the front margin of the ovate inflated hand.

"The *Third*, *Fourth*, and *Fifth Peræopods* very elongate, slender.

"The *Third Uropods* with the rami equal in length, laminar, setose on the margin.

"The *Telson* elongate, only a little apically cleft."

Gerstaecker says that the telson is "nicht gespalten," but this is not accurate.

Eusirus longipes, Boeck (Pl. LXXXVII.).

1860. *Eusirus longipes*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 656.
1870. „ „ Boeck, Crust. amph. bor. et arct., p. 77.
1876. „ „ Boeck, De Skand. og Arkt. Amph., p. 504.

Rostrum small, lateral lobes of the head not very prominent; the seventh segment of the peræon carinate, with a small postero-dorsal tooth; the first three segments of the pleon also carinate, the first two with a postero-dorsal tooth, and the postero-lateral angle produced in a small sharp point; the third segment with the long lower lobe of the hind margin serrate, the upper serratures pointing downwards, the lower upwards, the postero-lateral corners rounded, the serration continued a very little way along the lower margin; the fourth segment with a slight transverse dorsal depression; the sixth segment with the postero-lateral angles tri-denticulate.

Eyes large, reniform, close to the lateral lobes of the head, with numerous small ocelli, of about equal length and breadth.

Upper Antennæ.—The first joint much broader and a little longer than the second, each of them distally cut into four sharp points; the third joint narrower than the second and one-fourth its length, distally serrate; flagellum shorter than the peduncle, of nineteen joints, of which the first is much the longest, equalling the third joint of the peduncle; a calceolus, a cylinder, and some setules form the apical appendages of nearly every joint; the secondary flagellum of one long slender joint, pectinate on the outer edge, and a second minute joint, the two together nearly as long as the first of the primary. A specimen seemingly of the same species from Station 150 has thirty-eight joints in the flagellum.

Lower Antennæ shorter than the upper. First joint a little expanded, gland-cone well developed, decurrent; third joint short, distally toothed; the fourth joint as long as the second of the upper antennæ, rather longer than the fifth, with setules and spines on both margins, and distally toothed; the fifth joint much thinner, with many tufts of setules on the upper margin, distally denticulate and armed with spines and setæ; the flagellum much shorter than the peduncle, of seventeen joints, the first the longest, each with an apical group of setules.

Upper Lip distally broad, with a slit at the centre, a group of long cilia on either side, curving the one group toward the other; the surface also set with numerous long cilia over the whole breadth.

Mandibles.—The cutting plate on the left mandible elongate, scarcely toothed, with an indication only of a tooth above, and of a division of the large, blunt, tooth-like end below; the secondary plate divided into eight clear teeth, the general shape of the plate corresponding to that of the principal; on the right mandible the principal plate has no indication of a tooth above, but below is divided into two strong teeth, the lower of which while in preparation is seen to possess two sharp points; the secondary plate is of slighter construction than on the other mandible, distally forming two spear-head teeth, with

serrate edges, and having some smaller denticles on the sides; the spine-row consists of four elongate denticulate spines; the molar tubercle prominent, without being very large, its transversely elliptical crown set with many denticles; the palp set just over the molar tubercle, its first joint short, the second decidedly shorter than the third, with some seven long setæ along the outer surface, and some short ones on or near its convex inner margin; the long slender third joint with a group of four setæ on the outer surface near the base, and not far from the convex outer margin; the inner margin not convex, fringed for most of its length with pectinate spines, of which the narrow apex has five, two long and three short.

Lower Lip.—The principal lobes distally rounded, dehiscent, much ciliated; the inner lobes distally broad in proportion to their depth; the mandibular processes short, apically rounded.

First Maxillæ.—The inner plate almost oblong, with one plumose seta on the distal margin; the outer plate with eleven elongate spines, the innermost taking its rise lower on the plate than the rest, long, very thin, with seven small lateral teeth, the next four with four or five long lateral teeth, the next which is stouter and more curved with only one or two lateral teeth, the outermost with three, the remaining four in the parallel row are long and slender, with from four to six small denticles apiece; the first joint of the palp fully half the length of the second; the second reaching beyond the outer plate, its inwardly sloping apical border fringed with eleven slender spines or setæ.

Second Maxillæ.—The inner plate broader and shorter than the outer, the fringing setæ neither numerous nor long, reaching about halfway down the inner margin, and halfway across the broad distal margin; some being submarginal in origin; the outer plate has the apex somewhat narrowed, with spines of some length, the series passing a little way down the inner and outer margins, the three spines on the outer margin being, however, short and seta-like.

Maxillipeds.—The "prismatic" inner plates are short, scarcely reaching the centre of the first joint of the palp, with two short spines close together near the inner apex, the distal border truncate, carrying at the inner corner a setiform spine, three strong spine-teeth close together on the margin, followed on the outer slope by three slender curved spines; the outer plates reach the middle of the second joint of the palp, the inner margin bordered with twenty spines, the pectinate distal half of which is abruptly narrower than the proximal; two more, rather longer than the rest, occupy the apex, beyond which on the curve of the outer margin are four long slightly feathered spines or setæ, much more widely apart than the spines of the inner margin and apex; there is also on the outer surface near the inner edge a submarginal row of slender spines; the first joint of the palp has the outer apex acute; the second joint much longer, widening distally, with a few setæ and setules on the upper half of the outer margin, many setæ or spines along the inner margin, and some on the surface, especially near the apex; the third joint rather longer than the first, with spines on the distal part of the inner edge, and on the surfaces

within it, besides strong transverse groups on the inner surface and round the apical margin; the inner margin of the finger armed with three or four graduated spines, each having an accessory thread, the largest spines nearest the slender curved nail, at the base of which there is a cilium and a small decurrent spine; the finger has a dorsal cilium near the base of the nail.

First Gnathopods.—Side-plates much broader below than above, extending forwards to the base of the lower antennæ, the rounded front angle having a little indent, not a tooth, the hinder angle forming a sharp tooth, the slightly convex lower margin fringed with some setules; the first joint reaching much beyond the side-plate, the front margin a little concave, armed below with some long and strong spines, the hind margin convex, nearly smooth; the second joint with some small spines at the apex of the hind margin, the apex in front on either side forming an angle; the third joint short and broad, with spines along the lower part of the hind margin and the hind part of the squared distal border; the wrist with a very long front border, fitting when bent upwards into the channelled front of the first joint, the hind border very short, covered with a brush of serrate spines, not produced into a heel; the distal margin forming a large unsymmetrical cup, with a few spines at the hinder part; in this cup the great egg-like hand is seated, attached to the antero-distal end of the wrist; the front margin of the hand is smoothly convex, much shorter than the palm, but much longer than the free portion of the hind margin; the hind margin ends in a group of nine or ten very unequal but strong palmar spines, the integument near them showing some small scale-markings; the palm margin is smoothly convex, with another border within it on either side, these inner borders being fringed with spines or spinules abruptly narrowing at the distal portion, and being there pectinate; on the outer surface these spines are set obliquely, alternately larger and smaller, but nearly all the same size, on the inner surface they stand straight, and the sizes differ much; the long thin finger fits closely round the whole palm-margin, for which its inner edge appears to be channelled; it is smooth except for some very small hairs on the inner margin, and a small dorsal cilium near the hinge.

Second Gnathopods.—Side-plates a little deeper than the preceding pair but narrower, a little wider above than below, with a small tooth at each end of the lower margin, the hinder one being the stronger. The large branchial vesicles of this and the four following pairs have a slender accessory vesicle springing from the same base as the principal sac, but not attaining the same length. The limb in most respects resembles that of the first gnathopods; the first joint rather longer, without the great spines near the lower front angle; the third joint rather longer, with fewer spines on the hind margin; the wrist rather larger.

First Peræopods.—Side-plates a little larger than the preceding pair, sides nearly parallel, the lower margin with some setules and with a tooth at each corner. Branchial vesicles larger than the side-plates, much inflated. Limb slender; first joint reaching

much below the side-plate, fringed with setules; third joint longer than the fifth, much longer than the fourth, with spinules and setules along both margins; the fourth joint with larger spinules, and at the hinder apex carrying a spine; the fifth joint straight, fringed behind with slender spines, and having a few spinules in front; finger curved, acute, scarce half the length of the fifth joint, the edges finely pectinate; a dorsal cilium not far from the base of the nail.

Second Peræopods.—Side-plates with the front margin nearly straight, ending in a tooth, excavate behind, the hind margin below the excavation serrate and sloping forwards to join the convex lower margin. Branchial vesicles larger than in the preceding segment. The limb like that of the first peræopods.

Third Peræopods.—Side-plates broad, bilobed, the hinder lobe rather deeper than the front, its hind margin ending in a small tooth. The branchial vesicles nearly as large as the first joint. The first joint pear-shaped, the front margin convex, fringed with spines, the hind margin deeply serrate, the lower part straight, rounded at the lower angle; the second joint very short; the third scarcely longer than the fourth, much shorter than the fifth, its hind margin convex, decurrent, a little longer than the front, both margins armed, but as in the two following joints not strongly; the finger very slender, curved at the nail, not half the length of the long straight fifth joint, its margins pectinate.

Fourth Peræopods.—Side-plates with a deep hinder lobe; the branchial vesicles contorted. The first, second, and third joints of the limb similar to those of the preceding pair, but the first and third larger, the rest of the limb missing.

Fifth Peræopods.—Side-plates small, deepest in the middle. Branchial vesicles small and irregularly shaped. The limb resembling the third pair and the fourth so far as observed; the first joint larger than in the latter, the hind margin more sinuous; the third joint longer, the apical pointing of the hind margin of this and the following joint here becoming conspicuous, the armature of all the joints of more considerable strength; the superiority of size over the corresponding joints of the third pair is greater in the third and fourth joints than in the fifth and sixth.

Pleopods.—Coupling spines small, with three or four lateral teeth; there is a setiform spine close to the coupling spines, and there are also several other spines on the peduncles, especially about the apex; cleft spines five in number on the first pair, four on the other two; joints of the rami seventeen to eighteen.

Uropods.—Peduncles of the first pair shorter than the inner ramus, with some long spines on the inner margin and apex; the outer ramus shorter than the inner and than the peduncle, both rami with pectinate edges, marginal spines, acute apices; peduncles of the second pair much shorter than the inner ramus, apically dentate; the outer ramus as long as the peduncle, the inner much longer, longer than any of the other rami, the armature as in the preceding pair; peduncles of the third pair shorter than the rami,

with apical teeth of various lengths; the rami broad, lanceolate, with spines on both margins, which are pectinate; the outer ramus rather shorter than the inner.

Telson long and narrow, rapidly tapering, reaching much beyond the peduncles of the third uropods, cleft for about two-fifths of the length, the apices separate by a small triangular dehiscence for about one-third the length of the cleft, with the place of insertion for a spine or spinule a little above each apex on either side of it.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the dorsal apex of the third pleon-segment, three-tenths of an inch.

Locality.—Kerguelen, no depth specified. One specimen.

Station 150, Heard Island, February 2, 1874; lat. 52° 4′ S., long. 71° 22′ E.; depth, 150 fathoms; bottom, coarse gravel; bottom temperature, 35°·2. One specimen.

Remarks.—I cannot find any points of difference that would justify the separation of this southern species from the northern *Eusirus longipes*, Boeck, which Boeck identifies with *Eusirus helvetiæ*, Spence Bate, and *Eusirus bidens*, Heller. From *Eusirus cuspidatus*, Krøyer, it is distinguished among other things by the absence of the spine-teeth from the apex of the second joint of the maxilliped palp.

A specimen dredged at Station 3, lat. 25° 45′ N., long. 20° 14′ W.; depth, 1525 fathoms; bottom, hard ground; temperature of the water at the bottom, 37°·0, at the surface, 65°·0, has the first three segments of the pleon carinate, but the seventh of the peræon neither carinate nor dorsally toothed; the specimen measures three-fifths of an inch from the rostrum to the extremity of the uropods, not quite outstretched; the fifth joint of the lower antennæ is rather longer than the fourth, and is fringed with calceoli.

Genus *Eusiroides*, n. gen.

First Maxillæ with ten spines on the outer plate.

The Gnathopods with large hands attached in the ordinary manner, that is, by the base, not by the front margin, to the short cup-like wrists.

The Peræopods stout.

The other characters agreeing with the genus *Eusirus*.

Besides the three closely related species, respectively from three different localities, for which the genus has been instituted, it is probable that *Atylus monoculoides*, Haswell, and *Atylus lippus*, Haswell, both from Clark Island, Port Jackson, ought to be transferred to it.

The characters distinguishing this genus from *Eusirus* might, as a rule, be considered insufficient to warrant the introduction of a new generic name, but had the new species been included in the old genus *Eusirus*, the definition of that genus must have been deprived of one of its most salient points, the peculiarity of the attachment of the hand

and wrist. Krøyer in describing *Eusirus cuspidatus*, says that there are half a score of spines on the outer plate of the first maxillæ; in the form which I have considered to be *Eusirus longipes*, Boeck, there are eleven spines, but in each of the three species of *Eusiroides*, after careful examination, I can only count ten. In *Pleustes*, if I may judge from *Pleustes abyssorum*, which has some other points of resemblance to the genus *Eusiroides*, there are also only ten spines on the outer plate of the first maxillæ.

Eusiroides cæsaris, n. sp. (Pl. LXXXVIII.).

Rostrum small, carinate underneath, lateral lobes of the head rather prominent, flat in front, rounded below, separated by an incision from the short straight remainder of the lateral margin; the first two segments of the pleon dorsally produced backwards, each in a small sharp tooth, their postero-lateral angles produced in very small denticles, those of the third segment not produced, the lower lobe of the hind margin denticulate, the upward pointed denticles reaching almost to the top of it; the first segment distally and the second and third segments show only a suspicion of compression along the dorsal line, the back of the animal in general being broadly rounded; the fourth segment of the pleon with a transverse dorsal depression; the integument showing in many parts a strong striation.

Eyes large, reniform, not coming so near to one another at the top of the head, nor retaining so dark a colour in spirits, as the eyes of the next species, *Eusiroides pompeii*.

Upper Antennæ.—First joint longer than the next two united, twice as long as broad; the second joint much narrower than the first, and broader than the third, which is nearly half its length; the first joint has some groups of stout spines on the surface, and some mixed groups on the irregular apical margin; the second and third joints have some calceoli besides various groups of setules; the flagellum thick at the base, of seventy-four joints, is much longer than the peduncle; the earlier joints are broader than long, each having a large calceolus with attendant cilia and cylinders, the margins of the joints assuming a sort of spiral arrangement which is followed by the calceoli, for which there would not be room in single file; on the later joints their size diminishes, and from the slender terminal joints they are absent; the secondary flagellum, consisting of a single narrow joint, is not so long as the short first joint of the primary; its rounded apex is tipped with four setules.

Lower Antennæ not so long as the upper; the first three joints short, the first not expanded, the gland-cone inconspicuous, the second and third both more or less armed with spines; the fourth joint longer and broader than the fifth, carrying several groups of setæ and spines; the fifth somewhat longer than the second of the upper antennæ, armed like the fourth, but also having calceoli; the flagellum of fifty-five or more joints is thick at the base, most of the joints being much broader than long, armed as in the upper antennæ, the first joint about as long as its breadth.

Upper Lip.—The front margin rounded, the hairs at the centre standing out straight, while those on either side converge towards them; outside of the hairy tract are spiny cilia on either side, forming a curved band across the surface. In the figure *l.s.*, the inner plate is drawn protruding beyond the outer, not in its natural position.

Mandibles.—The cutting plate on the left mandible forming a single tooth with a strong, sharp, curved edge, bending round the secondary plate; in the unworn condition this edge has a triangular tooth lying upon it at the top, and is interrupted so as to form a small tooth before reaching the apex; the secondary plate has its margin divided into five strong teeth; on the right mandible the cutting plate has a strong process above, and is apically divided into two teeth; the secondary plate in profile appears to resemble that on the left mandible, but to be slighter, and to have the upper teeth smaller; the spine-row is composed of six long, curved, denticulate spines; the molar tubercle is prominent, with a small sharply-toothed crown, of almost triangular outline, set about with many cilia; there is a blunt-headed process between the molar tubercle and the palp; the first joint of the palp is short, the second much shorter than the third, its hind margin nearly straight, the front convex, with thirteen spines upon it or the adjoining surface; the third joint very long and narrow, with the hind margin smooth, convex, the front margin except near the base closely fringed with spines, those near the narrow apex of increased length.

Lower Lip.—The rounded distal margins of the principal lobes lightly ciliated, the inner margins dehiscent, each having near the top a projecting line of eight or ten spines, the roots of which are grouped on the surface; the rounded distal margins of the short thick inner plates are closely furred; the mandibular processes are short, apically rounded; their inner margin is continuous with a curved fold of the principal lobes, which is strongly ciliated with spiny cilia, especially where it approaches the group of spines above-mentioned.

First Maxillæ.—The inner plate much longer than broad, the apex sloping inwards with two slender spines or short setæ on the sinuous margin; the outer plate with ten spines on the truncate margin, the lateral teeth varying in number from two to seven on the different spines, but in all long and slender; the first joint of the palp more than half the length of the second, with two spines on the outer margin; the second joint with five setiform spines on the outer margin, five on the narrow apex, and ten on the oblique margin below it, which may be reckoned either as part of the apex or of the inner margin; there is one seta on the outer margin of the trunk below the palp.

Second Maxillæ.—The inner plate as long as and a little broader than the outer, with spines on the rounded distal margin and halfway down the inner margin; the outer plate with spines round the distal margin, the longest at the most advanced point, followed by four shorter ones on the outer side, the outer border having three long plumose setæ on the upper half, and a short seta or spine below.

Maxillipeds.—The inner plates distally widened, scarcely reaching beyond the base of the first joint of the palp, with three pectinate spines high up on the inner margin, followed by one or two on the inner surface and four on the distal part of the outer margin; the truncate distal border being filled by three strong spine-teeth, attended by two or three feathered submarginal spines on the outer surface; the outer plates not reaching the distal end of the first joint of the palp, the inner margin fringed with numerous slender spines of various lengths, distally pectinate, the series continued at the apex and some way down the outer margin by long plumose setæ, six on the outer margin not closely set; the first joint of the palp rather long and narrow, with three groups of spines on the outer margin and narrowed apex; the second joint not greatly longer than the first, distally very wide, the front margin and apex fringed with many spines, the hind margin having two small groups and its apex a large one, together with a small group and a solitary spine on the inner surface below it; the third joint shorter than the first, the apical margin broad and flat, surrounded by strongly pectinate spines, the inner surface set with various groups of spines, the apical part on the outer side closely furred; the finger short, with three spines on the inner edge, and two or three cilia at the base of the nail, which is short and curved; a dorsal cilium near the centre.

First Gnathopods.—Side-plates deeper than broad, advanced in front to the base of the upper antennæ, the broad convex lower margin slightly notched for cilia. The first joint reaching below the side-plate, distally widened, rather longer than the hand, channelled in front, the front margin concave, armed with long setæ and spines, the hind margin convex, with numerous groups of short stout spines on the surface just within it; the second joint short, with a group of spines on the hinder apex; the third joint short and broad, produced into a sharp point behind and in front, much of the hind margin fringed with groups of pectinate spines; the wrist short, broad, distally cup-like, the hind margin apically toothed, fringed like that of the third joint, the surface and the front margin also carrying a few groups of spines; the hand large, a broad oval, narrowest at the hinge of the finger, with a transverse groove on the outer surface near the base, the convex front margin not much longer than the hind margin and palm, having a few small groups of spines on the surface near it; the hind margin as distinguished from the palm very short, not free from the wrist, armed with three groups of plumose setæ; the long convex palm defined by several strong palmar spines in transverse line on the inner surface; the palm border itself is strikingly striated at right angles to the outer edges, the multitudinous fine rods of the striations being themselves transversely striated; at the base of the striated border runs a fringe of spines and spinules on the outer side, and near the base on the inner side another fringe of slender spines or setæ, beyond which are some more scattered groups on the surface; on the outer side just below the spines and spinules is a series of seven or eight great spines, each with a sort of lobe or tooth over

its base, and an accessory thread lying alongside of the stout apex; the large curved finger closes over the palm with its channelled inner margin, smooth except for a series of small hairs; the dorsal cilium near the base is quite small.

Second Gnathopods.—Side-plates oblong, rather narrower and but little deeper than the preceding pair, the convex lower margin similarly notched. The branchial vesicles longer than the first joint, very broad except at the base. The marsupial plates as long as the branchial vesicles, but much narrower, fringed with many setæ. The limb closely agrees with that of the first gnathopods; the first joint is longer, the third has fewer spines on the hind margin, and a more acute apex, the hand is larger.

First Peræopods.—The side-plates similar to the preceding pair, but rather larger. The branchial vesicles rather broader than the preceding pair. The first joint reaching beyond the side-plate, the front margin fringed with slender spines, the hind margin with mixed groups of stiff spines and setæ or slender spines; the second joint short, with apical spines on the hind margin, and, as in the preceding limbs, some spinules higher up, the front lobe flattened; the third joint much longer than the fourth and a little longer than the fifth, with spinules on the front margin and spines at its somewhat decurrent apex, and spines at six points of the front margin; the spines of the next joint are stronger, at five or six points of the hind margin, and at the apex of the front; the fifth joint has nine groups of spines along the hind margin, six spinules at four points of the front margin, and a group at its apex; the finger is short, about half the length of the fifth joint; the dorsal cilium very plumose, close to the base; there is a smaller cilium near the base of the nail.

Second Peræopods.—Side-plates broad, excavated behind for less than half the depth, and less than a third of the width, the hind margin below the excavation sloping gently forwards. The branchial vesicles very broad, longer than the first joint. The marsupial plates as long as the first joint, but not quite so broad. The limb like that of the first peræopods.

Third Peræopods.—Side-plates as broad as the preceding pair or broader, the hind lobe deeper than the front. The first joint of the limb broadly oval, subequally wide at the basal and distal ends, the front margin fringed with spines, the hind margin serrate, but not deeply; the second joint with flat hind margin and pointed apex, and having two groups of spines on the front; the third joint but little longer than the fourth, not longer than the fifth, all three stout, with serrate front margins, the third joint with six, the fourth with four, the fifth with seven groups of spines in front, each with an apical group behind, and some smaller groups on the hind margin; the finger small, curved, not half the length of the fifth joint.

Fourth Peræopods.—Side-plates with a deep hind lobe and a very small front one. The branchial vesicles of great breadth, longer than broad, with a small accessory lobe near the base. The limb similar in structure to that of the third peræopods, but con-

siderably larger and longer, the first joint not regularly oval, broader at the basal than the distal end, the front margin very convex, and the hinder nearly straight.

Fifth Peræopods.—The branchial vesicles small and irregular in shape. The first joint of the limb larger than in the preceding pair, much broader above than below; the third joint also larger than in the preceding pair, like it having spines at seven points in front and at five on the hind margin, which is a little decurrent. The rest of the limb missing.

Pleopods.—Coupling spines short but strong, with apical hooks and serrate sides; the peduncles have also some lateral groups of setæ and apical rows of spines; the cleft spines appear to be seven, six, and five in the series on the first, second, and third pairs respectively; the joints of the rami number from eighteen to twenty.

Uropods.—Peduncles of the first pair rather longer than the rami, spined along two margins, one of which is produced in a blunt process tipped with a large spine; the outer ramus rather shorter than the inner, both spined along the margins, and having a group of spines at the blunt apices; peduncles of the second pair scarcely as long as the outer ramus, which is considerably shorter than the inner; the margins of the peduncles apically sharp; the rami with spines along the margins, and a group on the blunt apex; peduncles of the third pair shorter than the rami, which are subequal, apically acute, with spines and plumose setæ along the margins.

Telson long and narrow, reaching beyond the peduncles of the third uropods, cleft beyond the centre, slightly dehiscent, the apices narrow but double, the outer point reaching a little beyond the inner, the interstice occupied by two or three cilia or setæ; on the sides near the base there are some minute setules, on the surface near the outer margin above the top of the cleft there are a pair of cilia, and some way below the top of the cleft a spine-like seta attended by a cilium.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the back of the third pleon-segment, rather more than half an inch. Another specimen measured, within the same limits, over three-fifths of an inch.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. Two specimens, one of them female.

Remark.—The specific name is derived from a character well known in the history of Rome.

Eusiroides pompeii, n. sp. (Pl. LXXXIX.).

Rostrum small, lateral lobes of the head with the front margin straight; the postero-lateral corners of the first two pleon-segments forming right angles, of the third segment rounded, denticulate, the upward-pointed denticles reaching halfway round the lower

lobe of the hind margin; the fourth segment with a slight transverse dorsal depression.

Eyes large, reniform, almost meeting at the top of the head, situated very near the front margin, with numerous small ocelli; dark in spirit-preserved specimens.

Upper Antennæ.—The first joint as long as the next two united, its length twice its greatest breadth, with one or two apical teeth, and two or three apical groups of spines; the second much narrower than the first, more than twice as long as the third, with some small groups of spines along the surface and on the bluntly toothed apex; the third joint armed in like manner; to a not quite complete flagellum there were fifty-three joints, the first broad, not quite so long as the third joint of the peduncle, showing within it eleven very short joints in preparation; almost every joint was armed with a calceolus and setules, many had also cylinders, these joints being distally more dilated than the others, and occurring at first alternately, then at intervals of two, and towards the end of two or three; the secondary flagellum consisting of a single slightly tapering joint, almost as long as the first of the primary, tipped with four setules.

Lower Antennæ shorter than the upper; first three joints short, gland-cone closely decurrent, third joint carrying some spines; fourth joint a little longer than the fifth, both carrying several groups of spines; the fifth joint about equal in length to the first of the upper antennæ; the flagellum thick at the base, with fifty-two or more short joints, the calceoli small.

Upper Lip so far as observed like that of *Eusiroides cæsaris.*

Mandibles.—These differ from those of the species just mentioned in the following points; the secondary plate on the left mandible has seven teeth, on the right mandible is thin and straight, drawn out into four teeth at different levels, the principal plate on this mandible being broad and massive; the spine-row has nine spines on the left, seven on the right, mandible; the long third joint of the palp has a rather broader apex, and besides the thick fringe of spines on the front margin, has near the centre of the convex hind margin a single short spine or seta.

Lower Lip as in *Eusiroides cæsaris.*

First Maxillæ.—Inner plate long oval, having on the inner slope of the apex two spines or short setæ, of which the upper part is slightly feathered; the outer plate carrying ten spines as in the species just mentioned, but with the lateral denticles less elongate, the innermost spine with many small denticles, the two outermost with but one denticle apiece; the first joint of the long and slender palp not more than half the length of the second, with two long spines on its outer margin; the outer margin of the second joint straight, smooth, the apex with three slender spines, eleven more fringing the oblique line running from the apex to the straight part of the inner margin; the spines are in two rows, longer in the one than the other; there is no seta on the outer margin of the trunk in our specimen.

Second Maxillæ.—The inner plate much broader and a little longer than the outer, the spines short, passing some way down the inner margin, but not nearly all round the broad distal border; the spines of the outer plate are much longer, passing a little way down the inner margin, and followed by some shorter spines not halfway down the outer margin.

Maxillipeds.—Differing in few points from those of *Eusiroides cæsaris;* the inner plates less expanded distally, with a row of six pectinate spines at the top of the outer margin; one of the plates had four, the other three, spine-teeth on the distal border; six slender widely-spaced plumose setæ descend far down the outer margin of the outer plate; the first joint of the palp has the apical spines, but not the groups on the outer margin; the second joint has the outer margin free except for a large apical group; there are also on one palp two, on the other three, rows at a little distance within it; on the inner surface of the third joint there are two long lines of spines; the finger on one palp had three, on the other palp four, slender spines on the inner margin, the larger number being on the opposite side to that which showed the larger number of spine-teeth on the inner plate.

First Gnathopods closely resembling those of *Eusiroides cæsaris,* except that the first joint has much of the lower part of both front and hind margin free from spines and setæ; the striated border of the palm is less deep and conspicuous.

Second Gnathopods closely resembling those of *Eusiroides cæsaris.* The front margin of the side-plates is less rounded at the lower corner, the teeth at the lower corner of the hind margin are more marked. The branchial vesicles are broad but not so long as in the other species, while the marsupial plates are broader and longer. The second joint of the limb has spines at the apex behind, but no spinules higher up on the hind margin; the hinder apex of the third joint is bidentate, with a spine in the interstice.

First and Second Peræopods.—These with the side-plates differ but little from those of *Eusiroides cæsaris.* The branchial vesicles are shorter, the marsupial plates wider, the joints perhaps scarcely so stout. In the side-plates of the second pair, the angle below the excavation is sharper than in the other species, and in the limb the third joint is rather shorter than that of the first peræopods, instead of being equal to it.

Third, Fourth, and Fifth Peræopods.—Between these and the corresponding limbs of *Eusiroides cæsaris* the difference depends chiefly on the first joint, which in the present species is comparatively narrow, a not very broad oval in the third peræopods, longer in the fourth, with the top widened, in the fifth still longer, with the front and hind margins nearly straight, converging a little downwards; the short second joint has a single group of spines on the hind margin, at its apex.

Pleopods almost as in *Eusiroides cæsaris,* but the coupling spines have a very strong lateral tooth, of which no trace was seen in the companion species; on the other hand, here the peduncles, though with many lateral setæ, appeared to be without the apical group of spines.

Uropods and *Telson* in all material respects like those of *Eusiroides cæsaris*, but the cleft of the telson not quite reaching the centre instead of extending beyond it, and the apical part of the telson slightly less acute.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the dorsal extremity of the third pleon-segment, barely half an inch.

Locality.—Station 151, Heard Island, February 7, 1874; lat. 52° 59′ 30″ S., long. 73° 33′ 30″ E.; depth, 75 fathoms; bottom, volcanic mud. One specimen, female.

Remarks.—The specific name is derived from Pompeius, the colleague of Cæsar in the celebrated Roman triumvirate. In addition to other marks of difference, this species shows none of the very striking striation of the integument which attracts attention in the preceding species.

Eusiroides crassi, n. sp. (Pl. XC.).

Rostrum small, lateral lobes of the head rather broad, irregularly rounded; postero-lateral angles of the first two pleon-segments produced in small teeth, those of the third segment almost right-angled, the hind margin not serrate; the fourth segment with a transverse dorsal depression.

Eyes very large, coming very near to one another on the top of the head, the inner margin concave, close to the front of the head, the ocelli numbering nearly two hundred.

Upper Antennæ very similar to those of *Eusiroides pompeii;* fifty-nine joints were counted of an incomplete flagellum.

Lower Antennæ as in the species just named; the gland-cone decurrent, well defined; fifty-two joints were counted of an incomplete flagellum.

Upper Lip with a broad distal margin, almost straight, and with the centre quite smooth, unless this appearance be due to the accidental turning back of the furred obtusely angled true margin; on either side is a tuft of spiny cilia, which seem to be confined to the margin, and not to form any curved band across the surface.

Mandibles differing from those of *Eusiroides cæsaris* is the following points—the cutting plates slighter in structure, the secondary plate on the left mandible having the terminal tooth much larger than the others, the spine-row consisting of six larger spines, with six much more slender; the teeth of the molar crown small; the palp much more massive, especially the long and broad third joint, of which the outer margin is quite smooth, extremely convex, while the inner margin is sinuous, bordered with a crowd of pectinate spines, and near the base with a few setæ; the apex, though narrow, has many long spines.

Lower Lip as in *Eusiroides cæsaris*, the lateral margins well rounded, so that the apices of the mandibular processes are directed a little inwards.

First Maxillæ.—The inner plates long and narrow, with three spines or setæ on the inner side of the apex; of the ten long spines on the truncate margin of the outer plate, the innermost has six lateral denticles, a shorter one beside it has three, the next beyond it four, the remainder being apparently content with two or one, the denticles being in most cases long; the first joint of the palp half the length of the second, with one spine on the outer margin; the second joint widest at the middle, where it has one spine on the convex outer margin; two rows of slender spines, longer and shorter, fifteen in number, fringe the oblique line from the apex to the point on the inner margin where the plate is widest.

Second Maxillæ similar to those of *Eusiroides pompeii*.

Maxillipeds very similar to those of *Eusiroides pompeii*, but the inner plates have a series of five or six plumose setæ beginning on the inner margin and passing on to the surface some way short of the apex, the apical border having three curved spines on the outer part, and on the inner four spine-teeth all less stout, and one much less so, than in the other two species of *Eusiroides;* the setæ on the outer margin of the outer plate do not descend so low as in either of those species; the first joint of the palp is apically acute, with spines on both sides of the point, the broad second joint has no spines on or near the outer margin except the apical group; the finger is more elongate, with a longer and sharper nail than in the other two species, with a single spine on the inner margin, and this in our specimen present only on one palp.

First and *Second Gnathopods* like those of *Eusiroides pompeii*, but the hinder apex of the third joint apparently not bidentate; the hands are rather more swollen at the middle, compared with the two extremities, than in either of the two preceding species, so that especially in the second gnathopods there is a more definite separation of the palm from the hind margin, yet not quite so marked a distinction as in the figure *gn.*2.

First and *Second Peræopods* similar to those of *Eusiroides pompeii;* the branchial vesicles shorter; the fifth joint of the limb with only seven groups of spines on the hind margin instead of nine.

Third Peræopods.—Side-plates with the hind lobe much deeper than the front. Branchial vesicles narrowly oval, much smaller than the first joint. First joint more oblong than oval, very broad, with a tuft of setæ near the top of the front margin, spines at four or five points below, the hind margin nearly straight, with few not deep serrations, the lower margin broad and rather flat, to a great extent overlapping the short second joint; the third joint broad, decurrent behind, longer than the fourth; the fifth and sixth joints missing.

Fourth Peræopods.—Side-plates with a deep hind lobe and a very small front one.

Branchial vesicles as in the preceding pair. First joint of the limb longer than in the third peræopods, more convex in front, the hind margin long and nearly straight, with few serrations, the lower margin more deeply overlapping the second joint; the third joint longer and larger than in the preceding pair, with spines at five points on the straight serrate front margin, and at four of the hind margin, which is convex above and straight below.

Fifth Peræopods.—Side-plates deeper behind than in front, but not lobed. The first joint like that of the fourth peræopods, but less convex in front; the fourth joint shorter than the third, with four groups of spines on the straight serrate front margin, and an apical group behind; the fifth joint about as long as the third, with six groups of spines along the serrate front margin; the finger much curved, about half the length of the fifth joint.

Pleopods.—Coupling spines not examined; cleft spines four in the series on the third pair; the joints of the rami on the same pair numbering eighteen.

Uropods similar to those of *Eusiroides pompeii;* telson comparatively shorter than in that species, the apices simple, but as these have a worn appearance in the specimen, this mark of distinction cannot be relied on; the lateral margins are without the slight sinuosity observable in the two preceding species; in fig. *ur.*3, the telson being removed, the acute apex of the ventral side of the sixth pleon-segment is seen.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the dorsal extremity of the third pleon-segment, about half an inch. The specimen was dissected unfortunately before the line of measurement had been drawn.

Locality.—Station 320, off Monte Video, February 14, 1876; depth, 600 fathoms; bottom, green sand; bottom temperature, 37°·2. One specimen.

Remark.—The specific name is derived from Crassus, the colleague of Cæsar and Pompey (or Pompeius) "in the first triumvirate" of Roman history. The name was chosen with a view to calling attention to the close alliance between this and the two preceding species. It may be convenient to compare the localities from which the three were respectively obtained: *Eusiroides cæsaris* came from Station 161, lat. 38° 22′ 30″ S., long. 144° 36′ 30″ E.; *Eusiroides pompeii* from Station 151, lat. 52° 59′ 30″ S., long. 73° 33′ 30″ E.; and *Eusiroides crassi* from Station 320, lat. 37° 17′ S., long. 53° 52′ W., so that, though not very remote from one another as regards the latitude, in respect to longitude the three species cover an enormous space.

Genus *Liljeborgia*, Spence Bate, 1862.

1860. *Iduna*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 656.
1862. *Liljeborgia*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 118.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 202.
1864. *Amathilla*, Grube, Die Insel Lussin und ihre Meeresfauna, p. 74.
1865. *Microplax*, Lilljeborg, On the Lysianassa magellanica, p. 18.
1870. *Lilljeborgia*, Boeck, Crust. amph. bor. et arct., p. 74.
1876. *Liljeborgia*, Boeck, De Skand. og Arkt. Amph., p. 496.
1876. *Lilljeborgia*, Sars, Prodromus descr. Crust. et Pycn. Exp. Norv., p. 355.
1880. *Eusirus*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 331.
1880. *Liljeborgia*, Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 34.
1882. *Eusirus*, Haswell, Catal. Australian Crust., p. 247.
1882. *Lilljeborgia*, Sars, Oversigt af Norges Crustaceer, pp. 27, 106.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 411.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 501.

For an account of *Iduna* see Note on Boeck, 1860 (p. 324). *Iduna* being preoccupied has been superseded by *Liljeborgia*, for the original definition of which see Note on Spence Bate, 1862 (p. 333). In 1865, Lilljeborg, unaware of the identity of Spence Bate's genus with Boeck's, changed *Iduna* into *Microplax*, which he placed in his third subfamily "Gammarina, Dana," and defined as follows:—

"Antennæ superiores flagello appendiculari præditæ. Caput antice non productum. Pedunculus antennarum superiorum mediocris et segmenta ejus ultima duo elongata.

"Pedes maxillares laminis interioribus præditi, laminæque hæ et exteriores minimæ et interiores vix basin palpi assequentes. Mandibulæ inter se similes."

Boeck in 1876 gives the following definition of *Liljeborgia*, for which in the list of errata he substitutes the erroneous spelling *Lilljeborgia*:—

"*Mandibles* apically strongly dentate; molar tubercle obsolete.

"*Upper Antennæ* shorter or little longer than the peduncle of the *Lower*; the accessory flagellum very long.

"*First Gnathopods* with the hand a little smaller than that of the *Second* pair, but of similar shape; the wrist rather short, produced into a heel behind and downwards.

"The *Fourth Peræopods* longer than the *Third*, and the *Fifth* than the *Fourth*.

"The *Telson* cleft to the base."

The last character must be modified as at any rate not applicable to all the species within the genus; it may be changed into—*Telson* more or less cleft. Lilljeborg's statement that the mandibles are alike is not entirely accurate, since the secondary plate on the right mandible is very different from that on the left.

Liljeborgia consanguinea, n. sp. (Pl. XCI.).

Rostrum narrow, sharply pointed, not half the length of the first joint of the upper antennæ, lateral lobes of the head narrow, distally rounded, outdrawn between the upper

and lower antennæ; the first segment of the peræon the shortest, the seventh the longest; the pleon carinate, each of the first five segments dorsally produced backwards in a small but pronounced tooth, with a cilium attached to the under side; the first three segments of the pleon long, the postero-lateral angles produced in a small sharp tooth, larger on the third segment than on the others, and on that segment upturned; the hind margin of the third segment is sinuous on each side below the dorsal tooth.

Eyes themselves not perceived, but from traces on the integument of the head it may be inferred that they were present, and of considerable size.

Upper Antennæ.—First joint considerably longer than the two following united, the second more than half the length of the first, with three groups of setæ on the inner side, distally produced into two sharp points, the third joint not longer than broad; the flagellum of thirteen joints, the first nearly twice as long as the third joint of the peduncle, all together rather longer than the whole peduncle; the secondary flagellum of nine (on one antenna of eight), joints, equal in length to the first five of the primary.

Lower Antennæ longer than the upper, the first joint little expanded, the second more than usually distinct from the first, with a blunt inconspicuous gland-cone, the third much longer than the second, with some small spines at the lower apex; the fourth joint more than twice as long as the third, with some spines along the margins, the fifth rather longer, also set with spines or short setæ; the flagellum of thirteen joints, not nearly so long as the peduncle.

Upper Lip.—The distal plate somewhat of a transverse oval in shape, its distal margin insinuate in a very slight almost imperceptible degree, furred in the usual manner. (This description is given from the Heard Island specimen.)

Mandibles.—The cutting edge angled, divided into six teeth, the four uppermost being small, the next the most prominent, the lowest as large as this or larger; the secondary plate of the left mandible is almost as large and powerful as the principal, its edge less oblique, divided into five teeth, of which the lowest is the largest, the uppermost the smallest, with two small denticles on its side; on the right mandible the secondary plate is much feebler, the edge denticulate with seven or eight little denticles and two moderately strong teeth at the lowest part; the spine-row consists of six spines, those nearest the cutting edge being the strongest; from the bluntness of these spines in actual use compared with their sharpness in preparation, it may be inferred that they are by no means merely ornamental appendages; beyond the spine-row, doing duty apparently for the molar tubercle, is a second row of five or six spines, set closely together, the first one or two short, the rest long, the furthest back being much the longest; the slender palp, exceeding the length of the trunk of the mandible, is fixed on a projection over the space between the two spine-groups, and has three almost equal joints, the second a very little longer than the first, and the first than the third; some four slender spines or setæ

high up on the inner margin of the second, the third with some twelve or thirteen similar spines or setæ on the margin and apex.

Lower Lip.—The lobes capable of wide dehiscence, ciliated on the narrow top and the inner margin ; the mandibular processes short and divergent. The figure *l.i.* A was drawn from the Heard Island specimen, and seems to show the extreme dehiscence of which the lobes are capable, causing the generally very divergent mandibular processes to assume a position parallel to one another. For what is probably the more normal position and appearance the figure of the lower lip of *Liljeborgia haswelli* may be consulted. On the inner margin near the apex there seems to be in both species a small spine among the cilia.

First Maxillæ.—Inner plate small, almost oblong, with a plumose seta at the apex and a shorter one below it ; the outer plate with ten spines of various lengths, two short, with only a single lateral tooth apiece, several long and slender and much denticulate, the strong outermost spine with a little denticle on each side ; the second joint of the palp reaching far beyond the outer plate, carrying five or six spine-teeth on the apical margin, and several spines on the inner margin and near the apex, besides two on the outer margin.

Second Maxillæ.—The inner plate short and broad, shorter and much broader than the outer, with plumose spines round the apical and a little way down the inner margin, the latter having some strong cilia below ; the inner plate has several spines on the apex, and two or more small ones on the outer margin.

Maxillipeds.—The inner plates narrow, not reaching much beyond the base of the first joint of the palp, with two long spines on the inner margin, three spine-teeth and four slender spines on the apical margin ; the outer plates narrow, reaching a little beyond the first joint of the palp, fringed on the inner side with ten or eleven spine-teeth, the two longest completely occupying the apex ; there are besides some submarginal slender spines on the outer surface ; the first joint of the palp is short, with two spines on the outer margin near the rounded apex, the second joint is very long, widening distally, fringed with spines on the inner margin and outer apex ; the third joint is also long, yet shorter than the second, like that having many spines ; the finger is long and broad, shorter than the third joint, the nail minute, the inner margin not much curved, pectinate, the dorsal cilium small, near the base.

First Gnathopods.—The side-plates narrow at the base, very broad below, the front margin running obliquely forward to the lateral lobes of the head, bending abruptly downwards, and forming a small tooth before bending round to join the long lower margin ; the hind margin nearly straight, forming a small tooth at its juncture with the lower margin. The first joint of the limb reaching much below the side-plate, slightly longer than the hand, and much narrower, with short spines standing out from the front margin, and many long setæ on the hind margin ; the second joint short ; the third not much

longer, oblong, with three groups of spines on the hind margin and one on the rounded apex; the wrist in front scarcely longer than the third joint, with an apical spine, distally cup-like, prolonged behind, and there set with many groups of spines of various lengths, the apical groups the largest, many, if not all, of the spines being pectinate; the hand large, oval, the front margin smooth, with a few spines at the apex, the hind margin also smooth, short, almost covered by the prolongation of the wrist, but very nearly continuous with the long curve of the palm, which is set with very many slender spines and spinules (smooth or almost smooth), and defined by some short palmar spines, near to which is a long row beginning with stout spines near the margin, and continued for some distance across the inner surface with longer and shorter stiff setæ; the long curved finger exactly matches the length of the palm, it has a small dorsal cilium near the base, its inner edge is smooth, except for three or four teeth or notchings near the base.

Second Gnathopods.—The side-plates broader above than below, the front margin convex, the hinder sinuous, the lower bounded by a small tooth at either end. The branchial vesicles narrow, much smaller than the first joint of the limb. The marsupial plates as narrow as the branchial vesicles, nearly as long as the first joint, fringed with setæ. The first joint reaching much below the side-plate, not so long as the hand, the front margin concave, the armature much as in the first gnathopods, with which in other respects the second closely agree, but the third joint is apically pointed, the hand is very much larger, and the seven teeth of the inner margin of the finger reach more nearly to the tip; the group of spines and setæ on the inner surface near the commencement of the palm is scarcely so large as in the other gnathopods, but there are some additional groups of spines near the outer margin.

First Peræopods.—The side-plates like the preceding pair. The limb slender; the first joint reaching below the side-plate, carrying long setæ on both margins; the third joint longer than the fifth, the fourth shorter, all three with setæ or slender spines on the hind margin; the finger narrow, a little curved, more than half the length of the fifth joint.

Second Peræopods.—Side-plates nearly as broad as the first pair, rather deeper than the third, excavate behind, the hind margin below the excavation straight, cut into four teeth. The limb like that of the first peræopods.

Third Peræopods.—First joint expanded, front margin convex, with spines at nine points, hind margin less convex, cut into nine notches; second joint short; third joint much longer and broader than the fourth or fifth, with spines at five points of the straight front margin and three of the convex hind margin; fourth joint slightly longer than the fifth, each straight, with an apical group of spines behind, and four groups on the front margin; finger small, half the length of the fifth joint.

Fourth Peræopods.—Side-plates shallow. Branchial vesicles narrow and short. First joint of the limb longer than in the preceding pair, with spines at nine points of

the front margin and some feathered cilia near the top, the hind margin nearly straight, serrate with ten teeth; the other joints resembling those of the third peræopods but longer.

Fifth Peræopods.—Side-plates very small. The first joint longer and broader than in the preceding pair, the hind margin very convex, notched into thirteen teeth; the third joint stronger than in the preceding pair, not so long as the fifth, armed with spines at five points in front and four behind; the fourth joint nearly as long as the third; the whole limb considerably longer than any of the preceding.

Pleopods.—Coupling spines small, slender, and much curved, with a row of five little lateral teeth just below the apex; below them is a slender plumose spine; the cleft spines appear to be four in number; the joints of the rami ten on the inner, eleven on the outer, branch. Only one pair of pleopods was examined.

Uropods.—Peduncles of the first pair but little longer than the rami, the inner apex sharp, the outer armed with a long spine, the outer ramus a little longer than the inner, the outer with two marginal spines, the inner with one, both with curved pointed apices; peduncles of the second pair reaching as far back as those of the first pair, equal in length to the rami; the rami equal, similar in armature to the first pair; peduncle of the third pair rather shorter than the rami, which reach beyond the other pairs with almost their whole length; the inner ramus a little shorter than the outer, broader, with two spines on the inner edge.

The Telson reaching beyond the peduncles of the third uropods, not quite twice as long as broad, cleft rather beyond the centre, slightly dehiscent between the apices, each of which is double, the outer point produced a little beyond the inner, with a long spine inserted between the two points.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the apex of the third uropods, a little over two-fifths of an inch.

Locality.—Station 149, Accessible Bay, Kerguelen, January 9, 1874; depth, 20 fathoms; bottom, volcanic mud. One specimen, female.

Station 151, off Heard Island, February 7, 1874; depth, 75 fathoms; bottom, volcanic mud. One specimen, from which the upper lip and maxillæ were figured.

Remarks.—The specific name refers to the obviously very close relationship between this southern species and the northern *Liljeborgia pallida*, Spence Bate. The present species is distinguished by its superior size, the greater number of spine-teeth on the outer plates of the maxillipeds, the less dentate inner margin of the finger of the first gnathopods, the relative proportions in the joints of the peræopods, and those in the three pairs of uropods; the telson here is cleft but little beyond the centre, while, according to Boeck, in *Liljeborgia pallida* it is cleft to the base.

Liljeborgia haswelli, n. n. (Pl. XCII.).

1880. *Eusirus dubius*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 331, pl. xx. fig. 3.
1882. „ „ Haswell, Catalogue of the Australian Stalk and Sessile-eyed Crustacea, p. 247.
1885. „ „ Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i., extract, p. 6, pl. xiv. fig. 1.

Rostrum narrow, sharply pointed, not half the length of the first joint of the upper antennæ, lateral lobes of the head rather broadly rounded, outdrawn between the upper and lower antennæ; the last two segments of the peræon and first five of the pleon dorsally produced backwards into a tooth; in the first and second segments of the pleon a large central tooth is accompanied by two others on each side, the nearer smaller than the more distant, on the third segment a very small tooth has on either side a large projecting lobe of the hind margin; the postero-lateral angles of the second and third segments have sharp points, very slightly produced; the sixth segment carries a pair of dorsal spines, beyond which its dorsal margin becomes duplex, diverging on each side of the telson.

The Eyes are oval, situated on the lateral lobes; when the ocelli are withdrawn there are markings left on the integument as if of incipient facetting.

Upper Antennæ.—First joint narrowing distally, much longer than the two following joints united; the second joint short, with the upper margin longer than the lower, carrying two groups of setæ, the distal margin oblique; the third joint broader than long; the flagellum of thirty-four joints, the first a little longer than the third joint of the peduncle, most of the joints having distally a group of setæ and a cylinder; the secondary flagellum of eighteen joints equalling in length the same number of the primary.

Lower Antennæ longer than the upper, the first joint a little inflated, the second very distinct, with a short and broad blunt gland-cone; the third joint but little longer than the second; the fourth joint long, with many groups of spines on the margins; the fifth still longer, with slenderer spines; the flagellum of twenty-four joints, of which the first is the longest, the whole flagellum much shorter than the peduncle.

Upper Lip.—The distal plate transversely oval, with no trace of insinuation of the distal margin.

Mandibles similar in structure to those of *Liljeborgia consanguinea*, but here the trunk is broader, while the palp is more slender, shorter than the trunk of the mandible, the third joint with three or four long setæ on the inner margin and three at the apex; the secondary plate of the left mandible is also considerably smaller than the principal plate.

Lower Lip.—The lobes dehiscent, ciliated round the narrow tops; the mandibular processes short, divergent, apically rounded.

First Maxillæ.—Inner plate small, with a long seta at the apex; outer plate short

and broad, with ten spines on the truncate apical border, none of them stout, many of them long, the innermost nearly straight, very minutely denticulate near the apex, the next very short, four long ones in the middle curved at the apex, and having four denticles below it, the rest shorter, with fewer denticles; the first joint of the palp very short, the trunk of the maxillæ rising to a point which overlaps it on the outer side, the second joint reaching far beyond the outer plate, with slender spines round the apical and much of the outer and inner margins, together with rather long spine-teeth on the apical margin.

Second Maxillæ.—Inner plates broadly oval, shorter and slightly broader than the outer, the rounded apical margin crowded with spines, which also descend halfway down the inner margin, at the lowest point being accompanied by long setæ or setiform spines; the outer plate has spines at intervals along the inner border, closely set round the apical, and of much diminished size along the distal half of the outer margin.

Maxillipeds.—The inner plates small, reaching a little beyond the base of the first joint of the palp, with several spines passing from the distal part of the inner margin across the outer apex, the truncate apical border having three rather long spine-teeth; the outer plates very narrow, reaching a little beyond the first joint of the palp, with ten spine-teeth along the serrate inner margin, including the longer two at the apex, which is scarcely distinct from the line of the inner margin; the first joint of the palp short, with a pointed apex on the outer side, at and within which are several slender spines; the second joint long, narrowed at both ends, fringed on the inner margin with spines, and having a few on the surface and on the distal part of the outer margin; the third joint shorter than the second, but much longer than the first, almost evenly broad except at the narrow bent base, with groups of spines on the lower part of the outer margin, along almost all of the inner margin, round the apical, and on both surfaces in closer rows at some distance within the inner margin; the finger narrow, much shorter than the third joint, rather longer than the first, with a small dorsal cilium near the base, a small cilium at the base of the minute nail, the inner edge finely pectinate.

First Gnathopods.—Side-plates narrow at the base, wide below, the front margin running obliquely forwards, rounded below and scarcely indented, the hinder margin indented but not serrate where it meets the lower margin. The first joint about as long as the hand, a little dilated at the centre, fringed with spines or setæ on both margins, the second joint as long as the third; the third with three or four groups of spines on the hind margin, which is apically acute; the wrist with a very short hind margin, distally cup-like, behind produced and fringed with many rows of pectinate spines; the hand large, not twice as long as broad, broadest beyond the commencement of the palm, which is very convex, set round with numerous slender spines or spinules of various lengths, and defined by palmar spines, some of which, including one long one, are inserted on the inner surface with a group of setæ close by; the fringing spines of the palm are

pectinate, with two hairs near the middle on one side conspicuous; the long front margin is not very convex, and like the short hind margin not armed unless by a few adjacent setæ; the long finger curves closely over the whole palm margin; dorsal cilium close to the base, very small.

Second Gnathopods.—Side-plates much narrower below than above, the front margin very convex, the lower scarcely distinguishable from it; the hind margin forming a little tooth where it joins the lower. The branchial vesicles as long as the first joint and rather broader. The marsupial plates longer, much narrower, fringed with setæ. The limb like that of the first gnathopods, but the first joint longer, with the front margin slightly concave, the second joint broader, the third with a more elongate apex, the wrist broader, the hand and finger considerably larger; the finger has seven teeth or notchings of the inner margin beginning from the hinge, the dorsal cilium is very small; submarginal to the outer rim is a row of setules over the notched part of the inner margin.

First Peræopods.—Side-plates like the preceding pair. Branchial vesicles nearly as long as the first joint and more than twice as broad. Marsupial plates as long as the first joint, but narrower; the first joint reaching much beyond the side-plate; fringed with setæ; the third joint longer than the fourth, shorter than the fifth but much broader, the hind margin nearly straight, carrying a few spinules; the fourth joint with slight spines at six points of the hind margin; the fifth joint with a row of eleven spines along the hind margin, and a long one at the apex of the front; the finger not half the length of the fifth joint, not much curved.

Second Peræopods.—Side-plates broad, though not quite so broad as the lower part of the first side-plates, the excavation behind narrow, the margin below it parallel with the front, having a small notch at the centre and one where it meets the lower margin. Branchial vesicles longer than the first joint, broader than the preceding pair. Marsupial plates and the limb as in the preceding pair.

Third Peræopods.—First joint expanded, the front margin convex, with spines at nine points, the hind margin nearly straight, with eleven notches of different depths, the lower margin almost straight; the second joint with the convex hind margin apically acute; the third joint longer than the fourth or fifth, with spines at five points in front and at four behind; the fourth joint shorter than the fifth, with spines at four points in front and two behind; the fifth with spines at eight points on one margin, and setæ and perhaps spines at eleven points on the other; the finger slender, not one-third the length of the fifth joint.

Fourth Peræopods.—Broken below the third joint; the first three joints very like those of the third pair, but larger.

Fifth Peræopods.—Like the third pair, but very much larger, the first joint at the top broader than in the fourth pair, as that is broader than in the third pair; the hind

margin deeply cut; the fifth joint with two rows of spines, but so far as observed without setæ.

Uropods.—Peduncles of the first pair scarcely longer than the rami, apically acute within, and on the outer side having a broad apical spine, the rami subequal, the inner perhaps a little the longer, with fewer and stronger marginal spines; the peduncles of the second pair not reaching back quite so far as those of the first, scarcely so long as the inner ramus; the outer ramus shorter than the inner, with the marginal spines less strong, its upper surface more deeply channelled; peduncles of the third pair not so long as the rami, reaching beyond the other two pairs with almost their whole length; the rami broad, lanceolate, reaching back beyond the other pairs, spined on both margins, which are partially pectinate, especially the inner edge of the outer ramus, which is rather shorter and narrower than the inner.

Telson long and narrow, reaching a little beyond the peduncles of the third uropods, cleft nearly to the base, the apices double, the outer point of each produced much beyond the inner, the spine inserted between them reaching beyond the outer point.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the apex of the third uropods, three-fifths of an inch.

Locality.—At Station 162, off East Moncœur Island, April 2, 1874; lat. 39° 10′ 30″ S., long. 146° 37′ 0″ E.; depth, 38 fathoms; bottom, sand and shells. One specimen, female.

Remark.—The specific name is given in compliment to Mr. Haswell, who has described and figured this species from Tasmania and Port Jackson, calling it *Eusirus dubius*, but as there is in fact no doubt whatever that it belongs to the genus *Liljeborgia*, the specific name *dubius* must be sacrificed in spite of its priority.

Liljeborgia æquabilis, n. sp. (not figured).

The specimen on which this species is founded was taken together with *Liljeborgia haswelli*, and bore so great a general resemblance to it that it was dissected as a variety, before any figure of the animal had been drawn. It appeared to be without dorsal teeth, but some small ones may have escaped observation; the third, fourth, and fifth segments of the pleon were compressed, but scarcely carinate; the postero-lateral angles of the first three segments of the pleon were produced in small sharp points; the third segment was lobed at the upper part of the hind margin.

Eyes large, with very numerous small ocelli, very dark in the specimen preserved in spirits.

Upper Antennæ with a broad tapering flagellum of twenty-three joints, the secondary flagellum of thirteen, together equal in length to eleven or twelve of the primary.

Lower Antennæ with a short, broad, tapering flagellum of eighteen or nineteen joints.

Mandibles.—The secondary plate on the left mandible has four strong teeth, on the right mandible it is very feeble and minutely denticulate; the spine-row consists of nine spines, their apices diverging a little fanwise; these are followed by a group of four seta-like spines, the nearer two short, the others long; the palp is broader than in *Liljeborgia haswelli*, the first joint the broadest, the second longer than the first, with two spines on the inner margin and four about the squarish apex, the third joint narrower than the second, shorter than the first, with three spines on the outer, one on the inner, margin, and three on the conical apex.

First Maxillæ.—The very short first joint of the palp is almost overlapped by an apically rounded process of the trunk of the maxilla.

Second Maxillæ.—The spines on the outer plate do not pass so far down the inner margin as in the compared species.

Maxillipeds.—The spine-teeth of the inner plate are fewer and larger; the finger is proportionately longer, compared with the first joint of the palp.

First Gnathopods.—These and the following pair are a little less massive than in the other species.

Second Gnathopods.—The branchial vesicles shorter than the first joint.

Second Peræopods.—The hind margin of the side-plates below the excavation without a notch, except an almost imperceptible one where it curves round to meet the lower margin. The third, fourth, and fifth peræopods differ from those of *Liljeborgia haswelli* in regard to the first joint, which has the hind margin convex, in the fifth pair very convex, and in all so minutely serrate as to appear almost smooth, in contrast to the deep notching of the other species; the fingers are very short, and a little curved; the fourth and fifth joints are fringed with long setæ or seta-like spines, but on this stress cannot be laid as a mark of distinction, since in the other species there are traces indicating the possibility that these ornaments were once present.

Pleopods.—Coupling spines small, apparently with two pairs of retroverted hooks; cleft spines four in number in one instance, five in another; the joints of the rami sixteen in number.

Uropods.—Peduncles of the first pair longer than the rami; the rami nearly equal, the inner a little the longer; peduncles of the second pair about as long as the inner ramus, which is broader and rather longer than the outer; the peduncles of the third pair shorter than the rami; the rami broad, lanceolate, spined on both margins and partially pectinate, but very finely; the outer ramus shorter and narrower than the inner.

Telson long and narrow, cleft almost to the base, the apices double, with two small points, the inner reaching scarcely beyond the outer, a small spine and a spinule occupying the interstice.

In the details of the mouth-organs and the limbs, apart from those which have been just specified, the specimen agreed so nearly with *Liljeborgia haswelli*, obtained in the same dredging, that recapitulation seemed unnecessary.

Locality.—Station 162, off East Moncœur Island, April 2, 1874; lat. 39° 10′ 30″ S., long. 146° 37′ 0″ E.; depth, 38 fathoms; bottom, sand and shells.

Remark.—The specific name refers to the comparative paucity of notches and teeth in the body and limbs of this animal.

Family Pardaliscidæ, G. O. Sars, 1882.

In 1870 Boeck instituted the Pardaliscinæ as the eighth subfamily of the Gammaridæ, and in his subsequent work transferred the group to the Leucothoidæ as the fifth subfamily, but without altering the definition, and in each case assigning the same three genera, *Pardalisca, Halice, Nicippe.* Sars in 1882 changed the subfamily into the family Pardaliscidæ. Boeck gave the following definition :—

"*Upper Lip* broad, insinuate below [distally].

"*Mandibles* without molar tubercle, not alike, apically dentate; one with, the other without, an accessory plate; the palp three-jointed; its second joint elongate.

"*First Maxillæ* with the palp tolerably broad, apically furnished with many teeth; the inner plate nodiform.

"*Second Maxillæ* with narrow plates.

"*Maxillipeds* with the inner plates little or obsolete, the outer plates either broad but rather short, or narrow; the palp elongate, narrow; the last joint unguiform.

"The body thick, inflated, with small side-plates.

"*Upper Antennæ* slender, with an accessory flagellum; the peduncle very short; the anterior joints of the flagellum in the male coalesced and together forming a large joint, furnished on the inner side with bundles of setæ.

"*First* and *Second Gnathopods* of the same shape.

"*First* and *Second Peræopods* strong, the third joint short.

"*Fourth Peræopods* longer than *Third*, *Fifth* than *Fourth*; in these three pairs the first joint not strongly dilated; the finger long.

"*Uropods* biramous; the rami almost equal in length; those of the third pair laminar.

"*Telson* elongate, cleft."

Buchholz in 1874 expressed the opinion that in *Pardalisca* both mandibles possess a secondary plate, but he was probably misled by observing a broad spine on the right mandible worn down by use to a stumpy condition, suggestive of its being a plate instead of a spine. Bruzelius in describing the right mandible of *Pardalisca cuspidata*, Krøyer,

says that it "has not any inner plate, but only a very little apically bifid tooth, situated on the inner side." J. S. Schneider in 1884, describing the same species, says of the right mandible that "the spine-row consists only of two curved spines serrate on one edge." Boeck mentions neither the two spines nor their equivalent, the bifid tooth. Of his own species, *Pardalisca abyssi*, he says that the mouth-organs are the same as in *Pardalisca cuspidata*. Schneider observes that in Boeck's De Skand. og Arkt. Amph., pl. xii., the figure (5*g*) which is numbered as representing the second maxillæ of *Pardalisca cuspidata* in fact belongs to *Syrrhoë crenulata*. He also remarks that in *Pardalisca cuspidata* the telson is not, as stated by Krøyer and Boeck, cleft to the base, but only for three-quarters of its length.

Genus *Pardalisca*, Krøyer, 1842.

1842.	*Pardalisca*,	Krøyer, Naturh. Tidsskr., Bd. iv. Heft 2, p. 153.
1852.	,,	Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 912.
1859.	,,	Bruzelius, Skand. Amph. Gamm., p. 101.
1862.	,,	Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 158.
1865.	,,	Goës, Crust. Amph. maris Spetsb., p. 13.
1865.	,,	Lilljeborg, On the Lysianassa magellanica, p. 18.
1870.	,,	Boeck, Crust. amph. bor. et arct., p. 71.
1870.	,,	Malm, Öfversigt af Kongl. Vet.-Akad. Förh., p. 547.
1874.	,,	Buchholz, Die zweite deutsche Nordpolarfahrt, p. 306.
1876.	,,	Boeck, De Skand. og Arkt. Amph., p. 481.
1884.	,,	J. S. Schneider, Crust. og Pycn. Kvænangsfjorden, p. 109.
1886.	,,	Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 508.

For the original definition of the genus, see Note on Krøyer, 1842 (p. 199). Boeck defines it as follows:—

"*Mandibles.*—The right mandible apically armed with four strong teeth; the left mandible furnished with weak teeth.

"*Maxillipeds* with the outer plate broad but short, not very prominent; the inner plate wanting.

"The *Upper Antennæ* longer than the lower; the peduncle very short.

"*Lower Antennæ* with the peduncle not very elongate.

"*First* and *Second Gnathopods* with the wrist more or less dilated; the hand narrow and not subcheliform; the finger (unguis) broad.

"*First* and *Second Peræopods* with the third joint dilated, but tolerably short; the fourth joint ovate, the finger laminar.

The *Third*, *Fourth*, and *Fifth Peræopods* not very elongate."

The statement, that the upper antennæ are longer than the lower, cannot be worth retaining, since Boeck himself says of *Pardalisca abyssi* that the upper antennæ are slightly *shorter* than the lower.

It will also be more accurate to speak of the inner plates of the maxillipeds as rudimentary or wanting, rather than as wanting without exception or qualification.

Pardalisca abyssi, Boeck (Pl. XCIII.).

1870. *Pardalisca abyssi*, Boeck, Crust. amph. bor. et arct., p. 72.
1874. „ *cuspidata*, Buchholz, Die zweite deutsche Nordpolarfahrt, p. 306, Taf. 1, fig. 3, Taf. 2, fig. 1.
1876. „ *abyssi*, Boeck, De Skand. og Arkt. Amph., p. 486.

Rostrum short, not very sharp at the apex, lateral lobes of the head not prominent, extending to the lower corners, which are rounded; postero-lateral angles of the first two pleon-segments acute, not produced, of the third a little rounded; the hind margin of the third and fourth segments with a pair of dorsal teeth, wider apart on the third than on the fourth segment.

Eyes not observed.

Upper Antennæ.—The first joint thick, as long as the two following together, the third not longer than broad, not half the length of the second; the flagellum much longer than the peduncle, of many short joints (more than forty); the secondary flagellum slender, of six joints, together equal in length to the first seven or eight of the primary.

Lower Antennæ.—The peduncle much longer than that of the upper pair; first joint dilated, gland-cone of the second long, decurrent; third joint short, scarcely longer than the second; fourth elongate, narrowing a little distally, fringed above with setules; fifth joint more slender, a little shorter, similarly fringed; the flagellum of more than thirty-three joints.

Upper Lip distally smooth, the broad shallow emargination making it not very unequally bilobed.

Mandibles.—Cutting edge of the left mandible of great breadth, with a little curved denticle at the top, whence the front margin runs out forwards and downwards, its straightness only interrupted by a little irregular blunt denticulation, then again retiring it forms three large teeth, the first the most prominent, the lowest by far the largest, broken in our specimen, but seen within in readiness for the next change of skin; the secondary plate is also broad, roughly triangular, its distal border pectinately denticulate, and in general outline looking like a hasty copy of the principal plate, but without the large lowest tooth; two curved spines, serrate on the concave edge, take their rise at the base of the secondary plate; the cutting edge of the right mandible is divided into four very pronounced teeth, of which the uppermost and shortest is incompletely subdivided, the lowest but one is the broadest; near the lower edge of the mandible there are two curved spines, one much broader than the other, with a double pectination on its concave side; the second which is much slighter seems to rise from the base of the first; the first

joint of the palp is more than twice as long as broad, the second joint is long, much curved, the outer margin concave, the convex inner margin fringed with slender pectinate spines, of which one near the centre is very long; the third joint is shorter than the second, both margins a little convex, the inner and the narrow truncate apex set with rows of finely pectinate spines.

Lower Lip.—The principal lobes distally narrow and strongly ciliated both there and on the inner margins, widely dehiscent; the inner lobes tumid, broad at the top, and much ciliated; the mandibular processes long, the outer margin making an elbow, the apical flat, sloping outwards.

First Maxillæ.—The inner plate small, with a single plumose seta at the apex; the outer plate widening distally, the distal margin oblique, carrying seven spines, the first long, seta-like, plumose or furry, the four following shorter, slender, with curved tips, the next very much stouter, the last again both longer and stouter, quite out of proportion to the rest; submarginal to the last but one is an eighth very slender curved spine, smooth-edged like the other six; the first joint of the palp longer than broad, the second curving round the outer plate, widening almost fan-like to a great breadth distally, the distal margin being set round with twenty small spine-teeth, accompanied by some setules which are continued down the inner border.

Second Maxillæ.—The inner plate rather longer and considerably broader than the outer, with the apex and most of the inner margin fringed by four and twenty very long plumose setæ, the outermost at the apex being shorter than those which immediately follow, but otherwise the size diminishing with great regularity from the apex downwards; the strap-shaped outer plate carries three similar setæ on the truncate apex.

Maxillipeds.—The inner plates rudimentary, rather longer than broad, the narrow truncate apex tipped with two long setæ; the joint which bears them is very short compared with the elongate second joint; this is fringed on both margins with numerous spinules or setules, and on the outer surface near the slightly concave inner margin armed with numerous very long setæ; the plates are about one-third of the total inner length of the joint, very little longer than broad, not reaching beyond the first joint of the palp, the slightly convex distal margin fringed with long spines, the series of spinules being resumed on the outer margin; the first joint of the palp is short, the second much longer, fringed on the inner side with very many long setæ and spines, and short setæ on the outer side; the third joint not longer than the first, fringed like the second; the finger not so long as the third joint, with spinules along the inner margin; the full breadth of the palp is not seen in the figure.

First Gnathopods.—Side-plates almost square, a little longer than broad, a little broader above than below, the lower margin fringed with spine-like plumose setæ. The first joint reaching far beyond the side-plate, widest at the distal end, the front apex of which is rounded, both margins fringed with various spines; the second joint with spines

along the hind margin; the third joint not elongate, distally rather cup-like, the upper part of the hind margin unarmed, the lower part fringed with long pectinate spines; the wrist not quite so long as the first joint, much longer and thicker than the hand, the front margin smooth, rather irregularly convex, the hind margin nearly straight, fringed with numerous spines, many of them very long; the hand more than half the length of the wrist, the front margin convex, smooth, the hinder slightly concave, densely fringed with spines which are finely pectinate on two edges; the finger much curved, a little shorter than the hand, of which it continues the front curvature, close to the smooth inner edge carrying a row of some sixteen submarginal spines, and a couple of cilia, one at, the other near, the base of the nail. The finger is not adapted for impinging against any part of the hand, but evidently hand and finger co-operate to enable the nail to reach the wrist.

Second Gnathopods.—The side-plates closely resembling the preceding pair. The branchial vesicles longer than the first joint, somewhat lageniform. The marsupial plates longer than the branchial vesicles, not narrow, fringed on both margins with long setæ. The limb closely resembling that of the first gnathopods; the second joint with a large group of spines on the hinder apex; the wrist much longer than in the preceding pair, widest just below the third joint, then narrowing towards the hand, the upper part of its hind margin more densely fringed than the lower.

First Peræopods.—Side-plates, branchial vesicles, and marsupial plates as in the preceding pair. The first joint reaching far below the side-plate, widening distally, the front margin serrate below and apically rounded, both margins fringed with very many spines; the second joint short, with long spines on the hind margin and its apex; the third joint triangular, twice as long as broad, the apex of the front margin having a group of spines, the hind margin serrate, fringed with long pectinate spines; the fourth joint longer than the third or fifth, a very narrow oval, attached to the front of the oblique distal margin of the third joint, its front margin smooth, the hinder fringed with long and short pectinate spines, the short continuing quite to the apex; the fifth joint long, almost linear, with spines at six points of the slightly convex front margin, the hind margin fringed with many pectinate spines; the finger short, less than half the length of the fifth joint, with a very small dorsal cilium near the base, the inner margin almost straight, with a very fine decurrent tooth on the inner margin at the base of the nail.

Second Peræopods.—Scarcely differing from the preceding pair, even in the size of the side-plates.

Third Peræopods.—Side-plates broader than the preceding pair, almost as deep in front, much shallower behind, with a sinuous lower margin, but scarcely to be called bilobed. The branchial vesicles and marsupial plates rather shorter than in the two preceding pairs. The first joint of the limb nearly three times as long as broad, with

some small spines spaced along the slightly convex front margin, and spinules on the convex lower part of the hind margin, the rounded end of which partially overlaps the following joint; the second joint short, having like the preceding joint a group of small spines on the front apex; the third joint long and narrow, shorter than the first, longer than the fourth or fifth, fringed with spines along the front border, and having submarginal groups of small spines near both borders; the fourth and fifth joints, which are equal to one another in length, have likewise these submarginal groups, but with stronger spines, and have their front margin fringed with long, slender, beautifully plumose spines, while the fourth has also on this margin five or six groups of long and strong spines; the finger is short and straight, not one-third the length of the fifth joint, its nail also is very short, curved; the apical spines of the fifth joint, round the base of the finger, have short accessory threads, and the margin below the thread finely pectinate, many of the other stouter spines being probably furnished in the same manner.

Fourth Peræopods.—The side-plates much broader than deep, rounded behind, not much deeper in front than behind; the front and lower margins nearly straight, fringed with spines. The branchial vesicles broader above than below, so attached to the narrow neck as to hang parallel to the first joint of the limb; near the neck there is a small accessory lobe. The limb resembles that of the third peræopods, but with all the joints longer, except the second; the first has four or five groups of slender spines at the top and six of shorter and stouter spines below; it is rather wider in most parts than the first joint of the third peræopods; the third, fourth, and fifth joints are about equal in length, with stout spines on both margins, but none of the long plumose ones seen in the preceding pair; the finger is larger in proportion to the increased size of the other joints.

Fifth Peræopods.—Side-plates like the preceding pair, on a smaller scale. Branchial vesicles broadest distally, not so long as the first joint of the limb, with an accessory lobe nearly half the size of the principal, and another much smaller. The limb similar to that of the preceding pair, except that the first joint is more expanded, its upper margin to the rear of the attachment slopes downwards, till at the greatest breadth of the joint it forms an obtuse angle with the hind margin, which takes a straight course to the narrowly rounded apical margin; the fourth and fifth joints are a little longer than in the preceding pair.

Pleopods not examined in the adult. In the young taken from the pouch, the coupling spines were very long and thin, with a lateral row of five sharp retroverted teeth, the inner ramus had but three joints, the first very long, with a single cleft spine near the top; the outer ramus had four joints.

Uropods.—The peduncles of the first pair longer than the rami, with numerous spines along the margins, and some strong ones at the apex; the outer ramus rather shorter than the inner, and with fewer marginal spines, each with a group at the apex; the

peduncles of the second pair shorter than the inner ramus, the outer ramus shorter than the inner, these rami being respectively rather longer than those of the first pair, similar in armature, the peduncles reaching back as far as those of the first, but not as those of the third pair; the peduncles of the third pair short, with a spine near the middle of the inner margin; the rami long and broad, the outer shorter than the inner, the outer margins almost straight, the inner and apical margins curved, thickly set with long plumose setæ.

Telson reaching beyond the peduncles of the third uropods, as long as the outer ramus of that pair, cleft for three-quarters of its length, the sides of the cleft diverging halfway down towards the apex, while the outer margins converge, a pair of double apices being formed, with a long spine in each cavity; near the lateral margin on either side the telson has four large spines, the two sides not being entirely symmetrical in the arrangement of them.

Length.—The specimen, in the position figured, measured one inch in a straight line from the rostrum to the apex of the second uropods.

Locality.—Station 49, south of Halifax, Nova Scotia, May 20, 1873; lat. 43° 3′ N., long. 63° 39′ W.; depth, 85 fathoms; bottom, gravel, stones; bottom temperature, 35°. One specimen, female.

Remarks.—It will be observed that this species is distinguished from *Pardalisca cuspidata*, Krøyer, by several particulars; the mandibular palps are longer, the spines on the outer plate of the first maxillæ have no lateral tooth, the outer plate of the second maxillæ is rather shorter instead of rather longer than the inner plate, the palps of the maxillipeds, and in especial the second joints, are longer, and the fingers of the two pairs of gnathopods are of very different structure.

Pardalisca marionis, n. sp. (Pl. XCIV.).

Rostrum small, the sides of the head scarcely lobed. The pleon missing.

Eyes not observed.

Upper Antennæ.—The first joint longer than the two following united; the third more than half the length of the second; of the flagellum eighteen joints remaining, together longer than the peduncle, the first joint as long as the third joint of the peduncle; the secondary flagellum of five joints, the first as long as the first of the primary.

Lower Antennæ similar to those of *Pardalisca abyssi*, but not apparently having the gland-cone elongate; the flagellum of twenty-nine joints, together not very much longer than the peduncle.

Upper Lip rather deeply emarginate, one side of the emargination being a straight

line which forms an angle with the convex lateral margin, while on the other side the lobe is rounded.

Mandibles in general like those of *Pardalisca abyssi*, but on the right mandible the upper semi-divided tooth is apically rounded, the other three being acute; there are two adjacent denticulate spines, one rather broader, the other rather longer, than its companion, both much longer in the new growth than the pair in actual use; the first joint of the palp is not twice as long as broad; the second joint is short, though longer than either the first or third, having on the convex inner margin and adjacent surface four short and four long pectinate spines; the oval third joint with a flattened apex, is armed with some eighteen or twenty pectinate spines.

Lower Lip as in *Pardalisca abyssi*, but seemingly less strongly ciliated.

First Maxillæ.—Inner plate not clearly observed; the outer plate with a widened distal margin carrying nine spines, the innermost long, plumose, setiform, the others with a single lateral tooth at or below the middle of the inner margin, the two outermost being the thinnest and shortest; on the surface near the outer corner there is a tenth submarginal spine, small, shaped like the majority; the first joint of the palp is but little longer than broad, the second from a narrow base expands rapidly, and the broad rounded distal portion is crenate, with fifteen little spine-teeth and slender spines in the interstices.

Second Maxillæ.—The inner plate broader but not quite so long as the outer, with seven long plumose setæ on the distal part of the inner margin and the oblique apex; the outer plate with three on its truncate apex.

Maxillipeds.—The inner plates scarcely distinct from the short joint which carries them, the distal margin forming an almost continuous slope, the part belonging to the plate, however, being flat and carrying two setæ, one moderately long, the inner very short; the second joint long, with a fringing on both margins of setules intermixed with spines, the plate much more than a third of the total length, reaching a good way beyond the first joint of the palp, its distal margin sloping outwards, having three setules on the outermost part, and a dozen spines of no great stoutness on the remainder; the first joint of the palp short, the second not very much longer, with some setules on the outer margin, three setæ on the inner, and two or three long ones at the apex; the third joint about as long as the first, narrowly oval, with spines along the outer margin and at the apex of the inner; the finger short and broad, with four curved spinules along the side, and a sharp narrow nail.

First Gnathopods.—Side-plates nearly square, but deeper than broad, not wider above than below, lower margin only slightly fringed. The first joint reaching much below the side-plate, of great breadth, about twice as long as broad, the front margin nearly straight, fringed with spines, of which there are several also along the surface, the very convex hind margin seeming to be free from them except at the apex; the second joint

short, with a spine at the apex of the hind margin; the third joint not long, distally cup-like, with a few spines along the hind margin; the wrist long oval, equal in length to the first joint, with a spinule or two on the convex front margin, and a fringe, but not a dense one, of pectinate spines on the moderately convex hind margin; the hand not nearly half the length or breadth of the wrist, twice as long as broad, with five plumose spines on the hind margin; the finger broad, exclusive of the nail not much longer than broad, with the nail nearly as long as the hand of which it seems to usurp the place, the hinder and distal margins set round with fourteen strong but very unequal spines, nine on the hind margin reaching the nail, and five on the apex at the other side of it; there are two cilia at the base of the nail.

Second Gnathopods.—Side-plates nearly like the preceding pair, but wider above than below, the setæ of the inner surface not reaching the lower margin. The branchial vesicles about as long as the first joint, rather narrow, widening a little below, with a slight curve at the centre, uniform with the three following pairs. The limb very like that of the first gnathopods, but with longer joints and the wrist slightly narrower; the first joint has the hind margin evenly convex; there are many pectinate spines on the lower half of the hind margin of the third joint; the wrist is densely fringed with pectinate spines of various sizes, but some of great length, along the hind margin, the density of the fringe becoming less near the apex; the hand, which is about a third the length of the wrist, is fringed on the hind margin with shorter spines; the finger is as in the first gnathopods.

First Peræopods.—Side-plates like the preceding pair. First joint of the limb widening distally, with spines along the almost straight front margin, and at the lower part of the rather convex hind margin; the short second joint with a distal group of spines; the third joint triangular, and (measured from the top of the hind margin to the apex of the front) nearly as long as the fourth joint, with four groups of spines on the hind margin, and one on the decurrent apex of the front; the fourth joint a narrow oval, attached near the hind margin of the preceding joint, its own hind margin fringed with pectinate spines; the fifth joint three-quarters the length of the fourth, much narrower, with six groups of spines along the hind margin, one at the apex of the front, and a spinule higher up; the finger rather broad, more than half the length of the fifth joint, with pectinate edges and a very small curved nail.

Second Peræopods.—Side-plates like those of the preceding pair. The limb missing.

Third Peræopods.—Side-plates much deeper in front than behind, but in front not so deep as the preceding plates. The limb missing.

Fourth Peræopods.—Side-plates a little deeper in front than behind, fringed below with spines. The first joint broad, not twice as long as broad, not so long as the third joint, with spinules along the convex front margin, the hind margin at first a little sinuous, then almost straight, the rounded apex partially overlapping the short second joint,

which has some small spines at the apex in front; the third and fourth joints long, equal in length; the fifth joint broken, probably equalling either of the two preceding in length; all three with marginal spines.

The *Fifth Peræopods* and all the *Pleon* missing.

Length.—The half specimen, in the position figured, measured, from the rostrum to the end of the peræon, three-twentieths of an inch.

Locality.—Station 145, off Marion Island, December 27, 1873; depth, 100 fathoms; bottom, volcanic sand.

Remarks.—The specific name is derived from the locality whence the specimen was obtained. This species from the south is remarkably like the northern species *Pardalisca cuspidata;* the mandibular palp is rather shorter, the spines on the outer plate of the first maxilla more numerous, the setæ on the inner plate of the second maxillæ less numerous, the maxillipeds broader, the first joint of the first gnathopods broader, and the finger in both the first and second gnathopods broader. Boeck speaks of the third joint in the first and second peræopods of *Pardalisca cuspidata* as very short, which would by no means agree with the present species, but in a specimen from Kvænangen, kindly sent me by Konservator J. Sparre Schneider, I find that the joint in question agrees well with that above described for the present species.

Genus *Synopioides*, n. gen.

Mandibles each with a secondary plate; the palp greatly elongate, the third joint linear.

Maxillipeds with long four-jointed palp.

The Gnathopods not subchelate, the hands tapering; in the first pair the hand longer than the wrist.

The Third (*Fourth?*) and *Fifth Peræopods* very elongate.

The Uropods with the rami of the first and third pairs equal or nearly so; in the second pair the outer ramus much shorter than the inner.

The Telson reaching beyond the peduncles of the third uropods, deeply cleft.

Fifth and sixth pairs of side-plates broader than the preceding pairs; none of the side-plates deep.

By the head and antennæ this genus recalls *Synopia*, Dana, whence the generic name, but in the hinder peræopods, in the third uropods and telson, it is suggestive of *Nicippe*, Bruzelius, and it seems to find a suitable place near, if not in, the family Pardaliscidæ. The inclusion of the genus in that family cannot, however, be accomplished without altering the character assigned to the mandibles, according to which one of them is devoid of a secondary plate.

Synopioides macronyx, n. sp. (Pl. XCIVa.).

Outline of head and back similar to that of *Synopia scheéleana* except at the fourth segment of the pleon, which appeared to have a laminar triangular process produced backwards on either side of the dorsal line, but these processes were not satisfactorily made out; the postero-lateral angles of the first three pleon-segments were more or less acute, those of the third segment most so.

Eyes not perceived.

Upper Antennæ.—The peduncle very short, the first joint scarcely projecting beyond the head, broad, about as long as the other two united, the upper margin longer than the lower; the second joint abruptly narrower than the first, a little longer than the still narrower third joint; the flagellum about five times as long as the peduncle, at first very thick, after the first six or seven joints tapering very rapidly to the thirteenth, and then becoming very slender for the remaining joints, which are about twenty in number; the first joint is as long as the following five or six united, and together with the next eight or nine carries a large brush of broad and long cylinders, as well as slender spines; some of the remaining joints have small setules; the secondary flagellum has three joints, together about as long as the first eight of the primary, the first joint considerably longer than the other two united, and much broader, the second longer and broader than the third; the third linear, tipped with two setæ.

Lower Antennæ longer than the upper; the first joint dilated, second very short, gland-cone small, a little prominent; the third joint about as long as the two preceding united, broad, with one margin convex, carrying some small spines; the fourth joint long and slender, widest near the base, armed at intervals with spines, some setiform, others stout, these latter being bristly for part of their length, a peculiarity shared by the stout spines in other parts of this animal; the fifth joint elongate, but shorter and thinner than the fourth, with spinules at intervals; the flagellum longer than the peduncle, consisting of about thirty unequal slender joints, with setules at the apices of most of them.

Upper Lip.—The distal margin of the principal plate not very broad, flattened, smooth; the outer plate not reaching nearly so far forward, with the distal margin almost the full breadth of the plate, emarginate but not deeply, smooth.

Mandibles.—The cutting edge of the left mandible (the right on the Plate) is broad and squared, with a sharp, projecting tooth at the upper end, accompanied by a smaller one above it, not projecting, and a rounded one alongside of it; at the lower end there is a smaller projecting tooth, with a still smaller below it, less projecting; the intermediate margin straight, cut into many minute teeth; the secondary plate is not much less broad, the upper corner rounded, minutely denticulate, the denticulation being continued for some distance along the front margin, and then followed by a row of six stronger teeth, and a seventh much larger and more prominent than the rest; the cutting edge of the

right mandible appeared to be simply convex, with one tooth or division at the lower end; its secondary plate is very small, widest distally, the distal margin being cut into several little teeth, and having a deep notch near the lower end, from which the denticles form a return row; there appeared to be two strong but not elongate spines on the spine-row, planted amidst a brush of cilia; the palp is remarkably long; the first joint short; the second very long, curved near the base, narrowing distally, fringed with long setiform spines, slightly plumose; the third joint long and narrow, more than half the length of the second joint, tipped with four or five long setiform spines.

The Lower Lip rather deep, the texture of extreme tenuity, distally finely furred; the mandibular processes narrow, divergent.

First Maxillæ.—The inner plate not ascertained; the outer plate having on the distal margin eight long spines, on which the lateral denticles did not appear to be either strong or numerous; the first joint of the palp is short, the second joint widening distally and curving over the outer plate, having on the distal margin seven spine-teeth, followed by six slender spines descending the serrate inner margin.

Second Maxillæ.—The inner plate broad at the base, tapering to a narrow truncate apex, on which there are three plumose setæ, the outermost very strongly feathered; the inner margin is fringed with about fourteen strong plumose setæ; the outer plate is very little longer than the inner, narrower except at the apex, which, as in the inner plate, has three long plumose setæ, the middle one perched on a little eminence beyond the other two, the outermost the strongest and most strongly feathered.

Maxillipeds.—Narrow (not in good order for examination). The inner plates appear to be very small, carrying some setæ on the inner margin and apex; the outer plates very long, but not reaching nearly to the apex of the palp's second joint, with some slender spines at distant intervals along the inner margin, and some strong curved spine-teeth on the apical margin; the palp very elongate, apparently both the first and second joints very long, the second rather the longer, both with many long setæ; the third joint not specially long, widening distally, carrying numerous setæ on both margins and the surface; the finger shorter than the third joint, scabrous, little curved, most so at the nail.

First Gnathopods.—The side-plates a little broader than deep, the front margin tending to concave, the lower margin straight, with a setule near the front corner. The first joint long, widening distally, attached near the lower hind corner of the side-plate, channelled in front, the front margins being concave, the hind margin convex; the second joint short, rounded in front, with some setiform spines near the apex of the hind margin; the third joint triangular, the hind margin considerably longer than the front, produced into a point lying close to the wrist, having a few setiform spines not far above the apex; the wrist channelled behind, slender, longer than the third joint, fringed on both the hind margins with long, slender spines or setæ; the hand longer than the wrist,

channelled behind, curved, widening slightly from the base, then narrowing to the apex, the front margin convex, with some slight spines at intervals, the hind margins carrying spines of very various lengths; the finger narrow and elongate, about half the length of the hand, with a dorsal cilium at about two-thirds of the length from the base, the inner margin nearly straight, with some short setules at intervals, and a series of four or five near the base of the nail, which is preceded by a strong nail-like tooth, between which and the actual curved nail there is a cilium.

Second Gnathopods.—The side-plates broader than deep, the front margin nearly straight, the lower very convex. The branchial vesicles narrow, lageniform, rather longer than the first joint, which they exceed in width. The marsupial plates longer than the branchial vesicles, fringed with very long setæ, which are distant except at the apex. The first joint channelled in front and a little convex, with spinules along the margins; the second joint short, with a group of several long and short setiform spines at the apex behind; the third joint produced to a long acute apex, the hind margin fringed with setiform spines, those near the apex of very great length; the wrist much longer than the third joint, and longer than the hand, with a few spines on the long front margin and at its apex; the hind margin where free from the third joint is slightly convex, and densely fringed with numerous groups of setiform spines of various lengths, some very long indeed; the hand widening a little from the base, then narrowing to the apex, the front margin very convex, with few spines, the hind margin gently concave, densely fringed with spines, more closely set than those on the wrist, but not so long, and having a few spines longer and stiffer than the rest, finely pectinate, with the ends flexible; the finger more than half the length of the hand, nearly as in the first gnathopods, but the tooth on the inner margin slighter.

First Peræopods.—The side-plates similar to the preceding pair, but rather deeper; the branchial vesicles also rather larger, and the marsupial plates longer. The first joint almost entirely free from the side-plate, with a few slender spines on the front and at the apex of the hind margin; the second joint short, with a group of setiform spines on the apex behind; the third joint widening distally, shorter than the fourth, with setiform slightly feathered spines at six or seven points of the hind margin, and apex in front; the fourth joint elongate oval, the hind margin fringed with many long slender spines; the fifth joint subequal in length to the fourth, or a little longer, but narrower, the hind margin serrate, with seven groups of spines; the finger long and slender, more than half the length of the fifth joint, straight till near the tip, the edges with a finely pectinate appearance.

Second Peræopods scarcely distinguishable from the first.

Third Peræopods.—The side-plates considerably larger than the preceding pairs, broader than deep, deeper in front than behind, the front margin oblique, the lower margin nearly straight, with a very slight convexity. The limb very long, its first joint

not greatly expanded, twice as long as broad, the front margin slightly convex, with nine or ten short spines on the lower two-thirds; of the hinder margins, one straight, the other convex, both smooth; the second joint very short; the third not broad, but longer than the first joint, the front margin straight, with five long spines at intervals, and some spinules; spines also at five points of the scarcely convex hind margin; the fourth joint rather shorter than the third, the front margin strongly serrate, the hinder slightly, each with spines at four points; the fifth joint very slender, longer than the third, serrate on both margins, with spines at nine points on each, the points not opposite one another; the finger long and thread-like, if complete in our specimen, measuring about one-third of the fifth joint.

Fourth Peræopods missing. The side-plates rather smaller than the preceding pair, but similar, much broader than deep, exceeding in breadth any of the first four pairs of side-plates.

Fifth Peræopods.—The side-plates apparently broad and shallow. The limb of great length, the first joint between oval and pear-shaped, being much dilated above so that the length does not greatly exceed the greatest breadth, the hind margin smooth, the front with two or three small spines on the lower part, and a larger one on the apex; the second joint very short, overlapped behind by the first, with a spine or two on the apex in front; the third joint considerably longer than the first, the hind margin with four strong spines on the convex upper part, the lower part almost straight, smooth, but with two spines at the apex; the front margin with eight or nine groups of small spines, the apex having also a long one; the fourth joint rather shorter than the third, straight, with serrate margins, the hinder having a single spine, and four strong groups, the front having five strong groups and two small ones; most of these spines, including even the small ones, appear to be finely pectinate in at least two lines; the fifth joint is broken, the remaining portion has both edges serrate and armed with spines.

Pleopods.—The peduncles stout, broader above than below; the coupling spines rather large and broad, the apical part fringed with a row of little retroverted teeth or spines, of which the lowest are the largest, but all are small; the cleft spines are large, two in number, the longer arm with many little tubercles on the inner side; the rami are equal, with about twenty joints in each.

Uropods.—The peduncles of the first pair are subequal in length to the rami, with numerous long spines on the two upper margins and on the apical margin; the rami equal in length, also with two rows of many marginal spines and some on the narrow but not pointed apices, the margins pectinate and the spines scabrous; the peduncles of the second pair about equal in length to the outer ramus, having spines on the two inner or upper margins; the outer ramus much shorter than the inner, the inner even longer than those of the first pair, both strongly spined on two margins and with pectinate edges; the peduncles of the third pair much shorter than the rami, with a spine at the inner apex;

the rami long, reaching beyond those of the other pairs, broadly lanceolate, the outer edges nearly straight, except at the distal end, the inner edges deeply serrate as well as pectinate, narrowing rapidly at the distal end to the acute apex, which on the outer ramus forms a small nail, and by so much extends beyond the inner ramus. Each ramus shows the remains of a fringe of setæ on the inner edge, the setæ being densely plumose and some of them of great length; the outer ramus has one or two spines in notches on its outer margin above the apex.

The Telson reaches considerably beyond the peduncles of the third uropods; the length about once and a half the breadth, cleft almost to the base, each division sharply incised at the apex, the outer point being produced beyond the inner, both acute, the interval between the outer apical points being rather less than half the breadth near the base.

Length.—The length of the specimen was unfortunately not taken before dissection; it was, I believe, without the antennæ, about two-fifths of an inch.

Locality.—Station 295, off the west coast of South America, November, 5, 1875; lat. 38° 7′ S., long. 94° 4′ W.; depth, 1500 fathoms; bottom, Globigerina ooze; bottom temperature, 35°·3. One specimen, female. In the tow-net attached to the trawl.

Remarks.—The specimen had been mounted in glycerine during the voyage, and was labelled "Tow-net at the trawl, 6 Nov. 1875, 1500 fathoms." There can be no doubt this refers to Station 295.

The specific name, from the Greek μακρός, long, and ὄνυξ, nail, alludes to the fact that the fingers (*ungues* of Latin descriptions) are long in both the gnathopods and (so far as observed) in all the peræopods in this species.

Family Gammaridæ, Leach, 1814.

In 1870 Boeck adopted the title "Gammarinæ. Dana, 1849," for the fifteenth subfamily of the family Gammaridæ. In it he included the genera, *Gammarus, Pallasia, Mæra, Melita, Elasmopus, Cheirocratus, Gammaracanthus, Niphargus, Amathilla, Melphidippa.* In 1872–1876 he made the Gammarinæ the eighth subfamily of the Gammaridæ, with the same definition and including the same genera as before. In 1882 Sars changed the subfamily into a family, with the title Gammaridæ, presumably accepting Boeck's definition, as he includes in it the same list of genera without addition or diminution, and with only the nominal exchange of *Eriopis*, Bruzelius, for *Niphargus*, Schiødte. For this group Boeck gives the following definition :—

"*Mandibles* both alike, robust, apically dentate; the inner plate also dentate; the molar tubercle very prominent; the palp elongate, three-jointed.

"*Lower Lip* with very broad plates; the inner plates large.

"*First Maxillæ* armed with strong spines, some furcate some serrate; the palp large, two-jointed; the palp of the left maxilla apically armed with spines, that of the right with teeth; the inner plate more or less strong.

"*Maxillipeds* with the outer plate larger or smaller, but never very large, armed on the margin with teeth (rarely spines) and apically with curved setæ; the inner plate elongate, furnished with three teeth and many setæ; the palp elongate; the last joint towards the apex very narrow, unguiform.

"The body more or less compressed.

"The four anterior [pairs of] side-plates generally of moderate size, rarely small.

"*Antennæ* elongate; the *Upper* with a multi-articulate flagellum and an accessory flagellum; the *Lower* only with a short flagellum.

"*First* and *Second Gnathopods* with the hand subcheliform.

"The *Fourth Peræopods* a little longer (paulatim crescentes) than the *Third*, the *Fifth* than the *Fourth*.

"*Uropods* biramous; very rarely the last pair uniramous (simplices).

"*Telson* laminar, cleft or not cleft."

In regard to the mandibles it should be noticed that as a rule the inner plate of the right mandible differs from that of the left; it may be questioned whether Boeck's distinction between the armature of the palp on the left and that on the right in the first pair of maxillæ is of general application; in regard to the comparative length of the hinder peræopods there is an exception to Boeck's rule, by his own account, in *Gammaracanthus loricatus*, Sabine, of which he says that the fifth peræopods are shorter than the preceding; lastly, with respect to the uropods, it will be found that he does not describe any of his genera as having the third pair uniramous, although in *Melita* the inner branch is very small (minimo), and little (parvulo) in *Niphargus*.

For the earliest definition of the "Gammarinæ" as a family, see Note on Latreille, 1802 (p. 72).

For the earliest definition of the family "Gammaridæ," see Note on Leach, 1814 (p. 86); Leach places in it the genera *Melita*, *Mæra*, *Gammarus*, *Ampithöe*, *Pherusa*, the first three of which are still retained in the family.

Genus *Gammarus*, J. C. Fabricius, 1775.

1775. *Gammarus*, Fabricius, Systema Entomologiæ, No. 129.
1777. „ Fabricius, Genera Insectorum, p. 142.
1779. „ Fabricius, Reise nach Norwegen, p. 258.
1781. „ Fabricius, Species Insectorum, p. 515.
1787. „ Fabricius, Mantissa Insectorum.
1788. Cancer *Gammarus*, Gmelin's Caroli a Linné Systema Naturæ, Tom. i. pars v. p. 2991.

1789. *Gammarus*, Abildgaard, Müller's Zoologia Danica, vol. iii. p. 33.
1791. „ Olivier, Hist. Nat. Insectes, tom. vi. p. 182.
1793. „ Fabricius, Entom. Syst. emendata et aucta, tom. ii.
1796. *Cancer* (*Gammarellus*), Herbst. Versuch einer Naturgeschichte der Krabben und Krebse, Bd. ii.
1796. *Gammarus*, Latreille, Précis des Caract. génériques des Insectes.
1798. „ Fabricius, Supplementum Entomologiæ Systematicæ.
1801. „ Lamarck, Système des Animaux sans vertèbres, p. 164.
1802. „ Bosc, Hist. Nat. des Crustacés, tome i. p. 78, tome ii. p. 139.
1802. *Cancer Gammarus*, Turton's Translation of Gmelin's Linnæus, vol. iii.
1802. *Gammarus*, Latreille, Hist. Nat. des Crustacès et des Insectes, tome iii.
1805. „ Viviani, Phosphorescentia maris.
1806. „ Duméril, Zoologie Analytique.
1806. „ Latreille, Genera Crustaceorum et Insectorum.
1808. *Cancer Gammarus*, Montagu, Trans. Linn. Soc. Lond., vol. ix. p. 93.
1810. *Gammarus*, Latreille, Consid. gén. Crust. Arachn. Insectes, p. 103.
1813. „ Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 402.
1814. „ Leach, Crustaceology, Appendix, Edinburgh Encyclopædia, vol. vii. p. 432.

For the original definition of the genus *Gammarus*, see Note on Fabricius, 1775 (p. 40). From the time of Leach the genus has been so universally accepted (for more or less numerous species) by writers on the Amphipoda, that it is scarcely necessary here to continue the synonymy, a clue to which will be found in the index. The following definition is given by Boeck in 1876 :—

"*Mandibles* with the third joint of the palp elongate, narrow.

"*First Maxillæ* with the inner plate broad, long, furnished on the inner margin with very many plumose setæ.

"The body not carinate. The three hinder segments of the pleon furnished in the middle with fascicles of spines. The anterior side-plates of moderate size.

"*Upper Antennæ* longer than the *Lower;* the peduncle moderately elongate.

"*Lower Antennæ* with a short flagellum.

"*First* and *Second Gnathopods* with the hand small; the *Second* larger than the *First.*

"The *Third Uropods* with long rami, furnished on the margin with spines and plumose setæ, extending beyond the rami of the two preceding pairs; the inner ramus more or less shorter than the outer.

"*Telson* long, cleft to the base."

For Dybowsky's definition of the genus, see Note on Dybowsky, 1874 (p. 427). Definitions of later date than Boeck's will be found in Carus, Prodromus Faunæ Mediterraneæ, p. 411 (1885); and in Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 511 (1886).

Gammarus locusta (Linn.).

1767. *Cancer locusta*, Linn., Syst. Nat., Ed. xii. p. 1055.
1775. *Gammarus locusta*, Fabricius, Systema Entomologiæ.

The fullest synonymy of this species is to be found in Boeck, De Skand. og Arkt. Amphipoder, p. 366 (1876). His earliest reference is to "*Cancer macrourus, thorace articulato, coeruleus*, Linné, Gothl. Resan., 1745, p. 260."

Several small specimens which appear to belong to this species were labelled as having been taken in "Vigo Bay, Spain, 21 May 1876."

Genus *Mæra*, Leach, 1813.

1813. *Mæra*, Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 403.
1814. „ Leach, Crustaceology, Appendix, Edinburgh Encyclopædia, vol. vii. p. 432.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii.
1816. „ Leach, Annulosa, Encyclopædia Britannica, Supplement, p. 425.
1817. *Mærza*, Latreille, Le Règne Animal, tome iii.
1825. *Mæra*, Desmarest, Consid. gén. sur la classe des Crustacés, p. 264.
1828. „ Johnston, The Zoological Journal, vol. iii.
1829. „ Latreille, Le Règne Animal, tome iv.
184–. „ Milne-Edwards, Le Règne Animal, Illustrated Edition.
1847. „ W. Thompson, Ann. and Mag. Nat. Hist., vol. xx.
1853. *Ceradocus*, Costa, Rend. della Soc. r. Borb.
1854. *Leptothoe*, Stimpson, Marine Invertebrata of Grand Manan, p. 46.
1857. *Ceradocus*, Costa, Ricerche sui Crost. Amf. Nap., pp. 175, 224.
1862. *Moera*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 187.
1862. *Megamoera* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 224.
1862. *Moera*, Bate and Westwood, Brit. Sess. Crust., vol. i. p. 348.
1862. *Megamoera* (*pars*), Bate and Westwood, Brit. Sess. Crust., p. 400.
1864. „ Grube, Die Insel Lussin und ihre Meeresfauna, p. 73.
1866. *Mæra*, Heller, Beiträge zur näheren Kenntniss des Adriat. Meeres, p. 38.
1868. „ Norman, Ann. and Mag. Nat. Hist., ser. 4, vol. ii. p. 416.
1870. „ Boeck, Crust. amph. bor. et arct., p. 127.
1874. *Moera*, Verrill and Smith, Invert. Animals of Vineyard Sound, p. 315 (21), and p. 559 (265).
1875. „ Catta, Revue des Sciences Naturelles (Montpellier), tome iv. No. 1.
1876. *Mæra*, Boeck, De Skand. og Arkt. Amph., p. 377.
1876. „ Sars, Prodromus descriptionis Crust. Norv. Exp., p. 359.
1877. „ Stalio, Catalogo Crost. dell'Adriatico, p. 168.
1878. „ Spence Bate, The Crustacea in Couch's Cornish Fauna revised and added to, p. 53.
1878. *Megamæra* (*pars*), Spence Bate, The Crustacea in Couch's Cornish Fauna revised and added to, p. 55.
1879. *Mæra*, Wrześniowski, Zool. Anzeiger, Jahrg. ii.
1880. *Moera*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. pp. 267, 332.
1880. *Megamoera*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. pp. 265, 335.
1880. *Moera*, Kossmann, Zoologische Ergebnisse des rothen Meeres, p. 132.
1880. *Mæra* (?), Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 12.
1880. *Megamoera*, G. M. Thomson, Ann. and Mag. Nat. Hist., ser. 5, vol. vi., July.

1884. *Moera*, Chilton, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract), p. 3.
1884. „ Miers, Report on Zool. Coll. H.M.S. "Alert," p. 315.
1885. *Mæra*, Carus, Prodromus Faunæ Mediterraneæ, p. 414.
1885. *Megamoera*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. (extract), p. 9.
1885. *Moera*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. (extract), p. 11.
1885. *Mæra*, Sars, Den norske Nordhavs-Exp., p. 177.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 510.
1887. „ Chevreux, Catalogue des crust. Amph. Bretagne, p. 19.

For the original definition of the genus *Mæra*, see Note on Leach, 1813 (p. 84), for that of *Ceradocus*, see Note on Costa, 1857 (p. 298), for that of *Leptothoe*, see Note on Stimpson, 1854 (p. 277), and for that of *Megamoera*, see Note on Spence Bate, 1862 (p. 335). Boeck's definition of *Mæra* is as follows :—

"*Mandibles* with the third joint of the palp narrow, not very elongate.

"*First Maxillæ* with the inner plate narrow and apically furnished with few plumose setæ.

"Body elongate, narrow.

"Side-plates little ; the fourth pair scarcely larger than the fifth.

"*Upper Antennæ* much longer than the lower, the peduncle elongate.

"The legs slender, elongate ; the *Second Gnathopods* with the hand much larger than in the first pair ; the *Third*, *Fourth*, and *Fifth Peræopods* with the first joint more or less dilated.

"The *Third Uropods* extended beyond the *First* and *Second* pairs ; the rami elongate, narrow, very setose on the margin ; the inner ramus only a little shorter than the outer.

"The *Telson* not very elongate, deeply cleft."

In *Mæra longimanus*, Leach, the third joint of the mandibular palp is longer than the second, and in *Mæra rubromaculata* (Stimpson) the inner plate of the *First Maxillæ* has the plumose setæ numerous instead of few, and not confined to the apex. The epithet "few" should, I think, be omitted from the generic character of the *First Maxillæ*.

Mæra rubromaculata, Stimpson (Pls. XCV., XCVI.).

1855–6. *Gammarus rubro-maculatus*, Stimpson, Proc. Acad. Nat. Sci. Philad., vol. vii.
1862. *Megamoera serrata*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 227, pl. xxxix. fig. 5.
1880. *Melita (?) Ramsayi*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 246, pl. x. fig. 1.
1880. *Moera rubro-maculata* (Stimpson), Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 267, pl. x. fig. 4.
1880. „ *spinosa*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 268, pl. x. fig. 5.
1880. „ *Ramsayi*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 334.
1882. „ „ Haswell, Catal. Australian Crust., p. 253.
1882. „ *rubro-maculata*, Haswell, Catal. Australian Crust., p. 254.

1882. *Moera spinosa*, Haswell, Catal. Australian Crust., p. 257.
1883. „ „ , Chilton, Trans. New Zeal. Inst., vol. xv. p. 81.
1884. „ *festiva*, Chilton, Proc. Linn. Soc. N.S.W., vol. ix. part iv. p. 3 (extract), pl. xlvi. fig. 2, *a. b. c.*
1885. „ *rubro-maculata*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. part i. p. 11 (extract), pl. xv. figs. 5–12.

Rostrum minute, lateral lobes of the head not very prominent, nasiform, the lateral margin below the lobe sigmoid; the first five segments of the pleon prettily serrate across the back, with setules in the serrations, in one of the specimens with fifteen teeth on the first segment, seventeen on the second, fifteen on the third, nine on the fourth, seven on the fifth, the central tooth being the most prominent, especially in the third and fourth segments; the postero-lateral angles of the first three segments sharply pointed, with a little serration of the lower margin in the first and second segments, and sometimes in the third, which also has the lower part of the hind margin serrate; the sixth pleon-segment with a dorsal tooth over the base of the telson, and a tooth further on and lower down on each side of the telson, which may be regarded either as dorsal or lateral, the segment also sharply pointed below. The ornamentation in this species seems liable to considerable variation.

Eyes oval, situated close to the margin of the lateral lobes.

Upper Antennæ with the peduncles a little, and the flagella much, longer than those of the lower antennæ; the first joint long, carrying some cilia and setæ, and armed along the serrate under side with four or five stout spines; the second joint more slender than the first but of equal length, or sometimes a little longer, with many groups of setæ, and on the under side several spines; the third joint scarcely more than a fifth of the length of the second, carrying some groups of setæ; the flagellum having in three different specimens respectively twelve, twenty-eight, and thirty-three joints, but the specimen with twenty-eight joints had on one antenna only sixteen, that with twelve had on one antenna only ten; in every case the first joint of the flagellum was much the largest, subequal to the third joint of the peduncle, while the last joint was in each case minute; the secondary flagellum varied similarly, having but four joints in the small specimen to accompany the primary of twelve, eight in the large specimen for the primary of sixteen, twelve for the primary of twenty-eight, in the third specimen, also large, ten for the primary of twenty-three, but on the other antenna eleven for a primary of twenty; the joints had apical groups of setules in both primary and secondary flagella, in the former also one or two short cylinders.

Lower Antennæ.—The lobe of the first joint not much expanded, the second joint short except for the very long decurrent gland-cone, which nearly reaches the distal end of the long third joint; the third joint carries some groups of setules; the fourth joint thinner than the third, but between two and three times as long; the fifth joint both shorter and thinner than the fourth, both carrying many groups of setæ; the flagellum

of sixteen joints in the specimen which had twenty-eight joints in the upper flagellum, of eighteen in that with thirty-three.

Upper Lip.—The distal portion almost semicircular, the central part of the margin furred.

Mandibles.—The cutting plate divided into five teeth; the secondary plate of the left mandible very similar to the principal, with its edge divided into four teeth; the secondary plate of the right mandible bifid, with four or more noticeable teeth or denticles above the two slender apical teeth, the group forming rather a bunch than a row as on the other mandible; spine-row of nine or more closely-set curved denticulate spines; molar tubercle massive, with an irregularly oval denticulate crown and a plumose seta; there is a process between the molar tubercle and the palp; palp set well forward, the first joint subequal in length to the third, the second long, concave on the outer margin, the inner margin and surface set with slightly feathered spines, some of them very long; the short third joint having a group of small spines about the middle, and a group of still longer ones at the apex, almost all of these spines being much longer than the joint.

Lower Lip.—The front lobes having a little projecting point where the distal and inner margins meet, strongly ciliated on both those margins, dehiscent, the space partially filled by the thick oval inner lobes; the mandibular processes divergent, the ends a little ciliated.

First Maxillæ.—The inner plate with its whole inner margin from the apex downwards closely fringed with some four and twenty plumose setæ; the outer plate having on the truncate margin nine spines, three of which are furcate, with a denticle within the fork, two or three have a single tooth below the apical, and the rest are pectinate; the first joint of the palp more than half the length of the second; the second not dilated, having several slender spines on its truncate margin, and several submarginal spines.

Second Maxillæ.—The inner plate not narrower but a very little shorter than the outer, with a long row of plumose setæ, beginning low down on the inner margin, and passing towards the outer apex, in a large specimen numbering twenty-nine; the apex is crowded with long spines, of which there is a row down two-thirds of the inner margin; the spines on the apex of the outer plate are as usual longer than those of the inner, the apical margin slopes outward, being there occupied, not, as often, with short spines, but with long ones that are plumose, and almost by their tenuity and flexibility deserving to be called setæ.

Maxillipeds.—The inner plates broad, reaching much beyond the first joint of the palp, with a row of plumose setæ beginning on the upper part of the inner margin and passing along the surface to the middle of the apical; the apical margin truncate, with a strong tooth at the inner corner, below which is a curved pectinate spine-tooth, two

large spine-teeth are on the border and a long row of stiff feathered setæ; the inner plates not quite reaching the end of the second joint of the palp, armed along the inner margin with large finely pectinate spine-teeth, the series continuing with increasing size and curvature round the distal margin, the spines there being plumose below, and the last one or two of the row becoming more or less setiform; there are besides on the surface adjoining the inner margin many slenderer, but not pointed spines; the palp has a first joint shorter than the third, the second long, the third short, oval; the finger subequal in length to the third joint; the nail much more than one-third the total length, with some setules on the inner margin near it; the dorsal cilium near the base of the finger is shorter than the nail.

First Gnathopods.—The side-plates shallow, with an appearance, not confined to this pair, as if the true first joint were enclosed between two side-plates, the inner being much the smaller, the lower margin outdrawn in front to a sharp point, slightly crenate, and fringed with setules. The first joint extending for almost its whole length beyond the side-plate, the front margin nearly straight, with setules, the hinder with long setæ above, and below these three groups of spines, of which some are finely pectinate; the second joint short, much narrower than the first, with an apical group of spines behind; the third joint oblong, produced to a sharp apex, the hinder margin fringed with many groups of spines; the wrist nearly as long as the first joint, longer than the hand (the difference seemingly greater in the large than the small specimens), crowded with pectinate spines on the hind margin and most of the inner surface, some showing along the front margin and at its apex; the hand at the commencement of the palm broader than the wrist; with many groups of spines along the hind margin, the longest row being at the commencement of the palm on the outer side; there are several groups also on the inner surface a little way from the hinder margin, and several close to the longer front margin; the oblique slightly convex palm is finely denticulate and fringed with submarginal spine-teeth and setules; the finger fits closely over it.

Second Gnathopods.—Side-plates broader above than below, broader than deep, with some small spines on the lower margin. Branchial vesicles tending to oval, broad distally. Marsupial plates narrow. The first joint rather broad, all but the narrow neck clear of the side-plate, the hinder margin fringed with long setæ or setiform spines; the second and third joints much as in the first gnathopods, but the third joint with only one group of spines on the hind margin in addition to the apical group; the wrist short, triangular, distally cup-like, its hind margin fringed with many pectinate spines; the hand massive, much longer than the first joint, widest distally, much wider than the wrist, with small groups of spines near the front margin and along and near the hind margin, which is apically produced into a tooth with a strong palmar spine on each side of it; the palm is convex, very oblique, and the sculpture of it varies not only in different specimens but on the two sides of the same animal (at least this was the case in three of the specimens

examined, one of them a female, and the same thing is noticed by Mr. Chilton in his account of *Mœra spinosa*, Haswell); the simpler form of palm regularly denticulate, and fringed with spine-teeth and setules, the other palm in the female specimen having a straight portion near the hinge, then a gap, and the remainder sinuous; the other specimen had two gaps in the palm margin, not very wide apart; the armature is the same in all forms; the finger is strong, gently curved or more strongly hooked, but always closing down into the cavity between the apical tooth of the hind margin and the palm border.

First Peræopods.—Side-plates and branchial vesicles similar to those of the preceding segment. The first joint extending far beyond the side-plate, with long setæ on the front margin above and spinules below, many long setæ on the upper half of the hind margin and spines on the lower half; the second joint with an apical spine behind; the third joint longer than the fourth or fifth, scarcely decurrent, with spines at four points on each margin; the fourth joint longer than the fifth, with groups of spines at six points of the serrate hind margin, and spinules at three points in front; the fifth joint with five groups of spines on the serrate hind margin, spinules at two points in front, and an apical group of spines; the finger short and stout, about half the length of the fifth joint, with a dorsal cilium near the base, and one or two setules at the angle of the inner margin in front of the nail, and a cilium near the outer margin.

Second Peræopods.—Side-plates a little broader at the base than the preceding pair, but otherwise similar. The first, third, and fourth joints of the limb shorter than in the first peræopods, to which these are in other respects similar.

Third Peræopods.—Side-plates with the front lobes as deep as the preceding side-plates, spinules on the lower margin, the hind part shallow and scarcely lobed. The branchial vesicles oval. The first joint long, about twice as long as broad, the margins nearly parallel throughout, the front with spines, the hinder serrate but not deeply; the second joint with an apical group of spines in front, the third, fourth, and fifth joints subequal in length, the third with apical groups of spines before and behind, setules on the front margin, spines at three points of the hinder, the fourth with five groups of spines in front and four behind; the fifth widens a little distally, and carries four groups of spines in front, and three behind; the finger is larger than in the preceding pair.

Fourth Peræopods.—Side-plates similar to the preceding pair but rather smaller, and with the front lobe much narrowed. The limb very similar to that of the third peræopods but much larger, and the armature much stronger, many of the spines, especially those at the apex of the fourth and along the hind margin of the fifth joint, being of very striking length; the fifth joint is rather longer than the third or fourth, but this appears to be sometimes the case also in the third peræopods.

Fifth Peræopods similar to the fourth pair, but with the first joint and the third smaller.

Pleopods.—Coupling spines very short, with two strong, lateral, retroverted teeth below the apical tooth, and several marginal denticles; there are some slender spines close beside the coupling spines, and some stronger spines at the apex of the peduncle; the cleft spines have short arms which are not very unequal; in specimen A the series consisted of six in the first pair, five in the second, and four in the third pair, but in specimen B the number was eight in the third pair, and therefore probably more in the preceding pairs; in specimen B I counted twenty-nine joints on the inner ramus, thirty on the outer ramus, of the third pair.

Uropods.—Peduncles of the first pair longer than the rami, carrying, besides the marginal and strong apical spines, a very conspicuous spine high up on the outer or under margin, which is interrupted to receive it; the outer ramus rather shorter than the inner, both carrying marginal spines, those of the inner curiously unequal in size, its margin finely pectinate, the blunt apices of both rami having groups of spines; peduncles of the second pair apically pointed, equal to the outer, shorter than the inner ramus, which has the same irregularity of spines as in the first pair, and its edge pectinate; both rami are blunt-ended, apically spined, reaching back little or not at all beyond the peduncles of the third pair; these are shorter than the rami, having two principal groups of spines, one on the somewhat produced outer apex and one on the inner edge, with others round the sculptured distal border; the rami subequal, broad and long, strongly serrate, and spined on both margins, besides having spines and spinules on the narrow but not pointed apex.

Telson short, shorter than the peduncles of the third uropods, broader than long, deeply cleft so as in a lateral view to appear double, the laminæ widely dehiscent, especially below, where the acute apices are almost as widely apart as the extreme breadth of the telson; between these and the angled but not outdrawn apices of the inner margins some long spines are inserted, two or three in each lamina.

Length.—The female specimen B (Pl. XCVI.), in the position figured, exclusive of the antennæ and the back-turned rami of the third uropods, measured seven-tenths of an inch.

Locality.—Station 142, off Cape Agulhas, December 18, 1873; lat. 35° 4′ S., long. 18° 37′ E.; depth, 150 fathoms; bottom, green sand; bottom temperature, 47°. One specimen (E, Pl. XCV.).

Station 163D, off Sydney, June 12, 1874; lat. 33° 57′ 30″ S., long. 151° 39′ 15″ E.; depth, 120 fathoms; bottom, green sand. Several specimens.

Off Port Jackson; depth, 30 to 35 fathoms. One specimen.

Remarks.—It will be noticed that two of the Stations, the one at the Cape, the other at the east of Australia, though not at very remote latitudes, are separated by more than 130° of longitude. *Megamæra serrata*, Spence Bate, was found at "Flinders's and

Hummock Islands, Bass's Straits, in sea-weed on a sandy beach." Dana's *Gammarus asper*, from the Sulu Archipelago, bears a suspicious resemblance to the present very variable species, but his enlarged drawing of the second gnathopod shows a wrist much too elongated to permit the identification. *Mœra spinosa*, Haswell, is from Tasmania, *Gammarus rubro-maculatus*, Stimpson, was found "on muddy bottoms in the circumlittoral zone, Port Jackson, Australia," and has been found in the same locality by Mr. Haswell.

The inner plates of the first and second maxillæ differ in armature from those of *Mœra grossimanus*, Montagu, but they differ also from those of *Megamœra longimanus* (Leach) Bate, in which, moreover, the third joint of the mandibular palp is longer than the second, while here it is shorter, so that I have not ventured to rely on these characters of the mouth-organs for re-establishing *Megamœra* against the general view that it is synonymous with *Mœra*.

Mœra bruzelii, n. sp. (Pl. XCVII.).

Head long in proportion to its depth, rostrum rudimentary, lateral lobes of the head rounded, the lower angle immediately below and a little to the rear of the lobes; first two segments of the pleon with postero-lateral angles produced in small points, but with the convexity of the hind margin extending beyond these points; the postero-lateral angles of the third segment sharply outdrawn, and the lower part of the hind margin sharply serrate; the sixth segment emarginate behind, forming a pair of dorsal teeth separated by nearly the width of the telson.

Eyes oval, situated near the margin of the lateral lobes of the head.

Upper Antennæ.—First joint long, rather narrowed distally, grooved on the under side, carrying a few cilia and at the apex below a spine; second joint longer and much thinner than the first, carrying a few slender setæ or setules; third joint about one quarter the length of the second; flagellum broken, thirty-five joints remaining in one antenna, thirty-six in the other, of which the first is the longest; secondary flagellum slender, of nine joints, together as long as the first eleven joints of the primary.

Lower Antennæ broken, evidently much smaller than the upper. First joint not inflated, gland-cone decurrent, not nearly reaching the end of the third joint, which is twice as long as broad, with a small spine in the middle of the upper margin and a group of setæ on the lower apex; the fourth joint slender, rather longer than the first of the upper antennæ, with spines at two points of the upper margin near the base, and groups of setæ on the lower margin; the rest missing.

Upper Lip broadly rounded, the greatest width not far from the front.

Mandibles.—Cutting plate with one tooth at the upper and two at the lower end of a broad margin; secondary plate of the left mandible with the broad edge divided into four

or five teeth, the lowest the most prominent; on the right mandible this plate has a bifid termination, with two or three accessory teeth higher up; spine-row of seven or eight denticulate spines; molar tubercle with prominent dentate crown; the process between the molar tubercle and the palp is broad-headed; the palp set a little in advance of the molar tubercle, contrasting by its slenderness with the breadth and bulk of the trunk of the mandible, the first joint unusually long, more than twice as long as its greatest breadth, the second joint longer than the first, bent, with seven or eight setæ, or thin setiform spines, along and near the convex inner margin; the third joint straight, subequal in length to the second, with three or four long thin setæ on each margin and a group of six at the apex.

Lower Lip broad, not very deep; the principal lobes widely dehiscent, much of the gap being occupied by the large inner lobes; the mandibular processes well developed, with rounded ends.

First Maxillæ.—Inner plate small, oval, apparently with one apical seta; outer plate with spines variously denticulate on the rather narrow truncate distal margin; these spines were worn and damaged, but the new ones (obscurely seen) in preparation within the plate appeared to be ten in number; the palp reaching beyond the outer plate, its first joint more than half the length of the second, with two setules at the upper part of the outer margin, the second joint broad, with two setules on the convex outer margin, ten or eleven long feathered spines round the distal margin, and some submarginal setiform spines.

Second Maxillæ.—The inner plate narrower and a little shorter than the outer, with spines round the distal border, and some plumose setæ at the upper part of the inner margin, also one or two setules lower down; the outer plate apically fringed with spines, the apex sloping towards the convex outer margin, which is fringed with setules.

Maxillipeds compact. Inner plates reaching far beyond the first joint of the palp, with plumose setæ on the upper part of the inner margin, which is apically produced into a tooth, the truncate distal margin being fringed with spine-teeth and curved spines; the outer plates reaching the distal end of the second joint of the palp, the inner margin fringed with long serrate teeth, of which there are eight round the apical border, longer and curved, none of them setiform; on the outer surface near the inner margin are groups of long spines, not dissimilar in character to the marginal teeth; first joint of the palp very short, a little longer than broad; second joint very long, between two and three times as long as the first, with numerous groups of spines along the inner margin; the third joint longer than the first, broadest at the centre, with spines on the inner margin and about the apex; the finger nearly as long as the third joint, with a spine-like nail, four or five setules along the slightly serrate inner margin, the dorsal cilium long, at some distance from the base.

First Gnathopods.—Side-plates greatly produced below and in front, so that the

depth of the plate is not equal to its breadth below; the lower margin serrate. The first joint reaching below the side-plate, with setæ on the hind margin, in groups on the inner surface, and at the lower part of the sinuous front margin; the second joint with an apical group of slender spines behind, and a spine higher up on the hind margin; the third joint apically pointed in front, slightly serrate, with two groups of spines behind, at the lower hind corner a row of ten small spines, followed by several long ones extending to the front apex; wrist longer than the hand, nearly as long as the first joint, both front and serrate hind margins and the distal half of the inner surface lined with groups of feathered spines; the hand oval, at the centre a little wider than the wrist, the front margin, the hind margin and palm, and the surface near the two latter, carrying many groups of more or less feathered spines; the palm minutely dentate, almost continuous with the serrate hind margin, distinguished from it by the denticulation, by palmar spines, and by the extent of the finger, which fits closely over it; the palm is also fringed with many submarginal spines and setules.

Second Gnathopods.—Side-plates not deeper than those of the preceding segment, not much deeper than broad, lower margin serrate, hinder sinuous, with some spines below. Branchial vesicles a broad oval, as long as the side-plate, but not quite so broad. First joint reaching much beyond the side-plate, rather longer than the branchial vesicle, with long setæ on both margins; third joint not much longer than the second, both front and hind margins apically produced to a point; the wrist triangular, cup-like, length and breadth subequal, the convex serrate hind margin apically pointed, with numerous groups of long and short serrate spines along it, the straight front margin almost unarmed; the hand oval, wider than the wrist and considerably more than twice its length, with eight groups of spines on the hind margin, aud several small groups near and at the apex of the long front margin; the palm is oblique, fringed with numerous short spines and setules, and the somewhat massive finger closes over it, laying its tip on the inner surface between two palmar spines, one of which is on the surface, the other on the margin, but the surface spine is accompanied by a curved group of setules placed in a small depression of the inner surface.

First Peræopods.—Side-plates scarcely differing from the preceding pair, the branchial vesicles rather longer. First joint of the limb more slender than in the preceding pair, with several spines along the hind margin, besides setæ of various lengths on both margins; the third joint much longer than the fourth or fifth, with a few spines and spinules on the margins; fourth and fifth joints subequal, with spines on the hind margin and spinules on the front, with an apical group of setæ; the finger small, not half the length of the fifth joint, the inner margin raised above the minute nail and there carrying two short setules.

Second Peræopods.—The side-plates a little deeper, and branchial vesicles a little longer, than in the preceding pair, otherwise similar; the limb similar.

Third Peræopods.—The front lobe of the side-plates produced below the hinder part, of which the lower margin is almost straight. The branchial vesicles like the preceding. The first joint long, with the hind margin strongly serrate, nearly straight, the front a little convex, with spines, the apical one long; the second joint short, almost completely overlapped by the rounded lower hind margin of the first joint; the third joint longer and much broader than the fourth or fifth, most expanded just below the narrow base, with spinules on the slightly convex front margin, five spines on the hind margin, below the fifth forming a short triangular decurrent apex; the fourth joint with the upper part broader than the lower, spines at five points of the front margin, one group about the middle of the hind margin and another at its apex including a long spine; the fifth joint slender, as long as the fourth, a little widened distally, with a single spine and four groups of spines on the front margin, and a group of long ones at the apex behind; the finger as in the preceding pair; the dorsal cilium near the base.

Fourth Peræopods missing.

Fifth Peræopods.—Side-plates with the front margin ciliated, deeper behind than in front. The first joint broader but not longer than that of the third peræopods, broader above than below; the third joint a little longer than in the third pair, of more even breadth, with spines at four points on each margin, the triangular apex behind having two little cilia; the fourth joint subequal in length to the third, but shorter than the fifth, with three groups of spines, besides spinules, on the front margin, and two groups behind; the fifth joint with spines at six points in front, and some spinules behind; the finger similar in shape to that of the third peræopods, but larger.

Pleopods.—Coupling spines very slender except at the base, with one large lateral tooth, and seven denticles including the apex; there is a simple spine beside the two with hooks; the cleft spines from three to four, placed far down the joint; the joints of the rami eighteen in number, the peduncles long, apparently grooved, with an apical process on the outer side, folded to assist in coupling the two rami; on the third pair one of the edges of the peduncles proved to be serrate below and spined.

Uropods.—Peduncles of the first pair longer than the rami, with spines on the margins, and a larger one on the produced outer apex, the outer ramus rather shorter and less broad than the inner, both with few marginal spines, and each with a group inserted in the apical cavity; peduncles of the second pair about as long as the outer ramus, this being a little shorter than the broad inner one, which has several marginal spines; each ramus with an apical group; the edge of the inner ramus in this and the preceding pair is finely pectinate, possibly also that of the outer ramus; peduncles of the third pair much shorter than the rami, which are moderately broad, lanceolate, subequal in length, with serrate margins carrying spines, and tipped with spines, the length of these rami equalling that of the inner ramus of the first pair, and reaching back a little beyond it.

Telson longer than broad, rather longer than the peduncles of the third uropods, cleft almost or quite to the base, apically a little dehiscent, about a quarter of its length from the apex, each division forming a little tooth on the inner margin with a spine in the cavity between the tooth and the continuation of the margin; the apical part of each division has four serrate points, not symmetrically arranged, being in one lamina all on the outer margin, in the other distributed, two on the outer, one on the inner, in each case the apex being the fourth.

Length.—The specimen, in the position figured, measured, without the antennæ, half an inch.

Locality.—Station 142, off Cape Agulhas, December 18, 1873; lat. 35° 4′ S., long. 18° 37′ E.; depth, 150 fathoms; bottom, green sand; bottom temperature, 47°. One specimen.

Remark.—The specific name is given out of respect to the eminent carcinologist, Bruzelius.

Genus *Elasmopus*, Costa, 1853.

1853. *Elasmopus*, Costa, Rend. della Soc. r. Borb.
1857. „ Costa, Ricerche sui Crost. Amf. Nap., pp. 175, 212.
1870. „ Boeck, Crust. amph. bor. et arct., p. 132.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 392.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 28.
1885. *Podocerus* (*pars*), Carus, Prodromus Faunæ Mediterraneæ, p. 395.
1887. *Elasmopus*, Chevreux, Catal. Crust. Amph. Bretagne, p. 20.

Mandibles with the third joint of the palp larger than the second.
First Maxillæ with seven spines on the apical border of the outer plate.
Second Maxillæ having the inner plate ovate, with setæ at the apex.
Upper Antennæ longer than the lower, with elongate peduncles.
Second Gnathopods larger than the first.
Third, *Fourth*, and *Fifth Peræopods* broad.
Third Uropods with broad, subequal, not very elongate, rami.
Telson deeply cleft.

For Costa's original definition, see Note on Costa, 1857 (p. 298). The present definition is altered from Boeck, who speaks of the third joint of the mandibular palp as being much greater than the second, curved, very setose; the third uropods he defines as having rami equal in length, short and broad, and the telson as very large, very deeply cleft; but in Costa's type species the telson is not very large, nor is it in Mr. Haswell's species, *Megamæra subcarinata;* therefore the epithet seemed unsuitable. Boeck is no doubt right in supposing that *Megamæra brevicaudata*, Sp. Bate, should be included in this genus, and in that species also the telson is small. The number of spines on the inner

plate of the *First Maxillæ* may not be constant either in the genus *Mæra* or in the genus *Elasmopus*, but, so far as I have been able to examine, in species of *Mæra* there are not fewer than nine of these spines, while in species of *Elasmopus* there are not more than seven. It is possible that *Moera incerta*, Chilton, 1882–3, may belong to the latter rather than to the former genus. *Moera crassipes*, Haswell, 1880, also in all probability belongs to this genus.

Elasmopus subcarinata (Haswell) (*Elasmopus persetosus*, Pl. XCVIII.).

1880. *Megamœra sub-carinata*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 335, pl. xxi. fig. 4.
1882. *Moera petriei*, G. M. Thomson, Trans. New Zealand Inst., vol. xiv. p. 236, pl. xviii. fig. 3.
1882. *Megamœra sub-carinata*, Haswell, Catal. Australian Crust., p. 260.
1883. *Moera petriei*, Chilton, Trans. New Zealand Inst., vol. xv. p. 82, pl. ii. fig. 4*a*.
1884. *Mœra sub-carinata*, Chilton, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract) p. 5.
1884. „ „ Chilton, New Zealand Journal of Science, vol. ii. p. 230.
1885. „ „ Chilton, Ann. and Mag. Nat. Hist., ser. 5, vol. xvi. p. 368.

Rostrum rudimentary, lateral lobes of the head rounded, with a very small lobe immediately below the large one, from which the margin slopes backwards, gently concave, to the rounded lower corner; first three segments of the pleon with the postero-lateral angles acute; submarginal spines at six points along the lower border of the third segment; the fourth segment behind the dorsal depression becoming dorsally bicarinate, the carinæ produced a little apically in sharp teeth, bending slightly towards one another.

Eyes large, reniform, situated near or on the lateral lobes of the head, dark coloured in spirits; ocelli small, numerous.

Upper Antennæ longer than the lower; first joint long, equal in length to the second but twice as broad, with three spines along the lower margin; second joint with many groups of setæ about it; third joint three times as long as broad, not half the length of the second, similarly furnished; flagellum broken, fifty-two joints remaining, the first longer than broad, the next thirty or so broader than long, all widening a little distally, and there carrying groups of setæ with an occasional cylinder; secondary flagellum of six joints tipped with setæ; the last joint rudimentary, the six together longer than the first six of the primary flagellum, or than the third joint of the peduncle.

Lower Antennæ.—Peduncles and flagella respectively shorter and thinner than those of the upper pair; the first three joints short, the first not expanded, the gland-cone well developed, decurrent, the distal margin of the two coalesced joints bearing three small spines above, below these being produced into a process longer than the gland-cone, and as long as the third joint; the third joint with a subdistal spine and setæ; the fourth joint much longer than the first three united, longer than the fifth, carrying numerous

groups of setæ on the margins and surface, and on one side near the base a group of spines; the fifth joint elongate, without the spines, but otherwise furnished like the preceding; the flagellum scarcely as long as the peduncle, of about seventeen joints, with apical groups of setæ, the first joint the longest, with marginal as well as apical setæ.

Upper Lip broad and deep, the distal margin rounded, closely ciliated, with the slightest central emargination, as narrow as it is shallow.

Mandibles.—Cutting plate with a smooth or faintly denticulate edge between a tooth at the top and two or three at the lower end; the secondary plate of the left mandible distally widened, divided into five teeth; on the right mandible the secondary plate is weaker, distally bifid, with a small process on the front margin near the base; the front tooth the stronger, with six or seven denticles along the edge, the hinder tooth with one minute denticle; the spine-row of three denticulate spines longer in our specimen on the right than on the left mandible; the molar tubercle very robust, with strongly dentate crown and plumose seta; a small process projects close to the base of the palp; palp slender and feeble, the first joint nearly three times as long as broad, the second longer than the first, with three setiform spines at the distal end, and one a little lower down; third joint nearly as long as the first and second together, with two setiform spines, longer than the joint itself, at the apex, a shorter one beside them, and three on the margin just below.

Lower Lip.—Principal lobes rather dehiscent, the inner and distal margins thickly furred, and, in addition to the cilia, having on each lobe a pair of very short, blunt-headed spines, one on each side of the inner distal corner; the inner lobes rather thick, oval, distally narrowed; the mandibular processes very long, subacute, very divergent.

First Maxillæ.—Inner plate with three, not very long, plumose setæ on the apex; outer plate with only seven spines on the truncate, slightly oblique, and rather narrow distal margin, the two outermost spines the strongest, with a single tooth just below the apex, the two next with two teeth so placed, the next with three short denticles, the next with three long ones, and the innermost with five or six that are minute; the dentation not exactly alike in both maxillæ; the first joint of the palp not more than half the length of the second, carrying a small spine at the outer apex; the second joint with a double row of rather long slender spines, sixteen in number, round the apex and oblique distal portion of the inner margin.

Second Maxillæ.—Plates elongate, the inner narrower and a little shorter than the outer, fringed round the sloping apex with many long pectinate spines, the row continued by plumose setæ on the distal part of the inner margin; the outer plate having its apex fringed with longer spines, this apical border sloping outwards, while that of the inner plate slopes inwards; the outer plate has some small setæ near the base of its outer margin.

Maxillipeds.—The inner plates not reaching so far as the distal end of the first joint

of the palp, carrying a row of ten plumose setæ, which from the upper part of the inner margin pass towards the outer apex; round the apical margin there is a row of eight plumose spines, followed by some elongate spine-teeth, with two short spine-teeth at the inner corner, these details being made out with some difficulty owing to the crowding of the garniture; the outer plates not nearly reaching the apex of the second joint of the palp, with ten graduated spine-teeth along the inner margin, followed without interruption by five on the apical border, the last of which is very long, and succeeded in turn by seven long setæ; the second joint of the palp is about twice the length of the first, fringed along the inner margin with many setæ or setiform spines; the third joint rather longer than the first, with many groups of spines or setæ about the distal half, apically produced on the outer side in a small ciliated process; the finger about as long as the third joint, with a slender nail, five or six setules along the distal half of the inner margin, and a small dorsal cilium not far from the base.

First Gnathopods.—Side-plates longer than broad, outdrawn below in front, the lower margin not serrate, but bearing some setæ and setules. The first joint reaching much beyond the side-plate, with many long setæ on the hinder margin, chiefly at the upper part, and a row on the surface directed forwards; the second joint with two groups of setæ on the hind margin; the third rhomboidal, with the lower border pointed behind, rounded in front, fringed with setæ, of which there are also four groups along the hind margin; the wrist a little shorter than the hand, with a long group of setæ at the apex of the front margin, many groups along the free part of the hind margin, and five groups on the inner surface; the hand oblong, a little widened distally, with a group of setæ at the apex of the rather convex front margin, and another below the apex, eight groups along the shorter serrate hind margin, nine passing obliquely across the inner surface, and a sinuous line of forty-three, thirty-six of which are short and of even length; the palm, which is pectinate, slightly oblique and convex, is fringed with setules, and has besides four groups of setæ on the outer surface, a continuation of the series on the hinder margin; the point of the finger closes down against a row of four or five small palmar spines on the inner surface; the dorsal cilium is small, near the hinge.

Second Gnathopods.—Side-plates not outdrawn, but the front margin descending below the hinder. Branchial vesicles with a narrow attachment, widening greatly, equal in length to the first joint of the limb. The first joint not nearly as long as the massive hand, distally lobed in front both on the outer and the inner side, some long setæ on the upper part of the inner margin; the second joint distally lobed like the first, in each case the outer lobe being larger than the inner; the third joint oblong, but with the hinder apex rather strongly produced, four groups of setæ on the hind margin; the wrist very short and broad, cup-like, with many setæ and spines on the small hind margin; the hand swollen out to a greater width than the wrist, slightly

contracting again distally, its length once and a half the greatest breadth, the front margin rather sinuous, almost unarmed, the shorter hind margin fringed with a continuous brush of very long setæ, which also cover a large part of the inner surface, and are continued along the palm; the palm begins with a small tooth-process, runs almost in a continuation of the hind margin obliquely to a larger tooth-process, which is followed by a small cavity and then by a bulky process armed with short spines and groups of setæ; over this the finger closes with a finely crenulate inner margin, making a bend over the cavity, touching the central tooth-process by the angular projection of its own inner margin, and with its point reaching the palm near the smaller tooth, its own curved outer margin being bent almost at a right angle.

First Peræopods.—Side-plates oblong, rather longer than the preceding pair, lower margin convex. Branchial vesicles with a narrow neck, distally of great breadth, longer than the first joint. First joint reaching much beyond the side-plate, curved a little backwards, with many setæ and setules on both margins; second joint short, with an apical group of setæ behind; third joint much thicker than fourth, longer than either fourth or fifth, with spines at four points in front, groups of setæ at five points of the nearly straight, slightly serrate, hind margin; fourth joint shorter than fifth, with spines at seven points of the hind margin, two apical setules on the front margin, and one minute one high up on the same; the fifth joint slightly curved, with nine groups of spines on the serrate hind margin, an apical group of setules on the front, and a small setule below its centre; the finger short, broad, more than half the length of the fifth joint, the inner margin forming an angle at the base of the short curved nail, with three setules shorter than the nail implanted at that point; the dorsal cilium very small, near the base of the finger.

Second Peræopods.—Side-plates broad, narrowly excavate. The limb as in the preceding pair.

Third Peræopods.—Side-plates not very deep. Limb as in the following pair, but on a smaller scale.

Fourth Peræopods.—First joint rounded oblong rather than oval, with a group of setæ at the top of the front margin, and spines at eleven points along it, the hind margin more convex, serrate, the serration continued on the rounded lower margin; the short second joint a little overlapped behind, carrying an apical group of spines in front; the third joint broad and strong, expanding distally, and distally a little decurrent before and behind, with spines at five points of the serrate hind margin, and a group fringing the truncate apex, mixed groups of spines and setæ at five points of the serrate front margin; the fourth joint widened distally, with mixed groups of spines and setæ at four points of the serrate front margin, a similar group on the apex of the hinder, and some setules and spinules higher up; the fifth joint equal in length to the third, not so broad as the fourth, but still stoutly built, with seven groups on the serrate front margin, five (chiefly

of setæ) on the hinder; the finger short, similar to that of the first peræopods, but broader and more curved.

Fifth Peræopods.—The first joint differing from that of the preceding pair in being much larger, the hinder expansion being extended considerably above and below the front part of the joint; the second joint entirely overlapped behind by the first; the rest of the limb similar in structure to that of the fourth peræopods, but still more massive, the third and fourth joints much, and the fifth a little, longer; the margins strongly serrate; the third joint with spines at four points of the hind margin, and a large group of spines and setæ at its apex; on the front margin a small spine at one point, followed by four large mixed groups; the fourth joint, almost as long as the fifth, is surrounded by great groups of spines and long stiffly outstanding setæ; the fifth joint has many more groups of a similar kind; this joint, as shown in the figure *prp.*5, has a capacity for twisting into a direction the opposite of its normal position, without becoming detached.

Pleopods.—Coupling spines small; a long spine inserted on the peduncle above them, and many plumose setæ on the sides of the peduncle; cleft spines four to six in number, with short, nearly equal arms, set some way from the base of the long first joint; joints of the inner ramus seventeen, the last very short.

Uropods.—Peduncles of the first pair a little longer than the rami; the outer ramus rather shorter than the inner, both with blunt ends and groups of strong apical spines, the inner branch with five along one of its edges, the outer with three on one edge, four on the other; the peduncles of the second pair broad, scarcely so long as the broad inner ramus; the outer ramus a little shorter than the inner, both with blunt ends and groups of strong apical spines, also closely spined along the margins; peduncles of the third pair shorter than the very broad rami, of which the outer is a little longer than the inner, which has three groups or rows of spines on the inner, and one on the outer, margin, while the outer ramus has four rows on each margin, those on the outer margin the stronger, each ramus having also a large row of spines along the broad, truncate, slightly emarginate, apex.

Telson not so long as the peduncles of the third uropods, concave below, not quite so long as broad, cleft nearly to the base, widely dehiscent, the convex outer margins being apically produced in long points considerably beyond the acute apices on each side of the cleft, the interval between each pair of apices being occupied by two long unequal spines.

Length.—The specimen figured measured, in a straight line from the front of the head to the end of the sixth peræon-segment, three-tenths of an inch, and as much more from the end of the sixth segment of the peræon to the extremity of the uropods.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. Two specimens.

A specimen of this species was labelled as having been taken "June 3, 1874, off Port Jackson, 30 to 35 fathoms."

Station 168, off New Zealand, July 8, 1874; lat. 40° 28′ S., long. 177° 43′ E.; depth, 1100 fathoms; bottom, blue mud; bottom temperature, 37°·2. One specimen.

Mr. Haswell, in establishing the species, records it from "Port Jackson (very common at low water among Algæ, etc.), Botany Bay; Port Stephens."

Remarks.—By the kindness of Mr. G. M. Thomson I have been enabled to dissect a specimen from Lyttelton, New Zealand, of his *Moera petriei*. In that specimen the inner plate of the first maxillæ has only two apical setæ, the first pair of side-plates are less outdrawn at the lower front angle, the sculpture of the palm of the second gnathopods differs greatly from that in the Challenger species above described, the hand is without the great brush of long hairs or setæ, the finger ends obtusely like that of *Melita proxima* (*obtusata*), Sp. Bate, the rami of the third uropods are less broad, each lamina of the telson has four apical spines, and in the fourth and fifth peræopods the hind margin of the first joint is less convex. On the other hand the description and figures given by Mr. Thomson of *Moera petriei*, from Port Pegasus, agree so closely with the Challenger specimen above described that I feel bound to withdraw the specific name *persetosus* engraved on the Plate, and also to accept the conclusion at which Mr. Chilton has arrived, that *Megamoera subcarinata*, Haswell, and *Moera petriei*, Thomson, are one and the same species, although presenting some variety of form even in the same sex. Mr. Chilton in the New Zealand Journal of Science says, "I have both male and female specimens from Sydney, the females resembling those from Lyttelton Harbour, and described in the Transactions of the New Zealand Institute, vol. xv. p. 82. Curiously enough the males agree with those described by Mr. Thomson from Stewart Island, and differ from my Lyttelton specimens in having 'the whole lower surface [of the propodos of the posterior gnathopoda] very densely fringed with two rows of long simple hairs.' These hairs, which are of the same size throughout their whole length, and thus differ from the ordinary setæ found in this genus, are entirely absent in the Lyttelton specimens. An interesting question thus arises, but for the present must remain unanswered:—What is the function of these hairs, and why should specimens from Sydney and Stewart Island have them, while those from Lyttelton have not?" Mr. Chilton tells me that he subsequently found that "the form of the propodos is slightly different in the specimens from the two localities. In the Annals and Magazine, when considering the question whether the species presents an example of "dimorphic" males, Mr. Chilton says, "I would like to point out that I have not as yet had a sufficient number of specimens of *Moera subcarinata* to make me feel quite sure that the two forms are not simply animals of different ages." He refers also to the possibility of alternating forms, as discovered by Faxon in *Cambarus*. As to the long setæ of the second gnathopods, my

observation does not entirely confirm Mr. Chilton's, for in the Challenger specimens they appear to run out as usual to a fine apex, unless where broken or surmounted by some parasitic growth, although it is quite true that for almost the whole length the thickness is uniform.

Elasmopus delaplata, n. sp. (Pl. XCIX.).

Rostrum rudimentary, lateral lobes of the head with flattened curve, and a small lobe just below and a little to the rear; first and second segments of the pleon with the postero-lateral angles not very sharp, the third segment with these angles rather out-drawn, the lower part of the hind margin rather strongly serrate, and one serration on the lower margin just behind the angle; submarginal spines on all the three segments.

Eyes rather small, oval, placed near the margin of the lateral lobes, white in the specimen preserved in spirits, the ocelli small.

Upper Antennæ with the peduncles and flagella respectively much longer than those of the lower pair; first joint elongate, narrowing a little distally, longer and thicker than the second joint, carrying a few cilia; second joint widening a little distally, carrying several groups of setæ on either side; third joint shorter than the second, but also elongate, widening distally, and carrying many groups of setæ; the flagellum longer than the peduncle, of thirty-five joints, the last minute, tipped with setæ, the others carrying two apical groups of setæ and a cylinder; the secondary flagellum slender, consisting of three long and one short joint, the tip of which reaches the end of the fourth joint of the primary flagellum.

Lower Antennæ.—First three joints very short, lobe of the first not protruding, gland-cone decurrent, reaching the end of the third joint, fourth joint much longer than the first three united, nearly as long as the second of the upper antennæ, carrying several groups of setæ; fifth joint a little shorter, much more slender, carrying many groups of setæ; flagellum of sixteen joints, the first as long as the two following together, the others increasing in length from the second to the thirteenth, all carrying apical groups of setæ, and, all but the last three, central groups also.

Upper Lip tending to circular, with the distal margin a little flattened, ciliation slight.

Mandibles.—Cutting plate with an almost smooth edge, bounded by a not very prominent tooth at the top, and two large ones below; secondary plate of the left mandible, broad at the base and the distal margin, the latter cut into five strong teeth, of which the lowest is the largest; in the Plate these teeth are seen in profile; on the right mandible the secondary plate is bifid, the forward tooth the longer, both more or less denticulate; the spine-row on the left mandible of four, on the right of three, denticulate curved spines; the molar tubercle massive, dilated at the crown, which is surrounded by denticles, covered on one side by a honeycomb pattern, and carries

some short setæ besides the usual long one; the process over the molar tubercle is long and conspicuous; the first joint of the palp, immediately above this, is short, widening distally; the second joint is moderately long and straight, and, besides setæ along the inner margin, has a succession of groups upon the inner surface, that near the apex containing a row of some ten very long setæ; the third joint is longer than the two preceding united, has four or five groups of setæ on the outer surface near the convex outer margin; the inner margin is sinuous, forming with the outer a sharp apex; not far from the base it presents a groove or fold, about the middle of which begins a marginal row of short pectinate spines, more than seventy in number, succeeded by six long ones which carry the series to the apex.

Lower Lip.—Mandibular processes large, rounded at the ends.

First Maxillæ.—Inner plate oval, small and narrow, with a plumose seta on the apex, and below it three or four setules; outer plate with seven spines on the oblique truncate apex, the three innermost spines having from five to seven long denticles towards the upper part, the others five or fewer; the second joint of the palp rather wide, reaching beyond the outer plate, having round its convex dentate margin ten thin spines, the apical pectinate on both edges, and eight submarginal spines.

Second Maxillæ.—The inner plate rather shorter and narrower than the outer, the rounded distal margin fringed with spines, the series not reaching the outer margin, and bounded by plumose setæ just at the top of the straight inner margin; the spines round the apical margin of the outer plate descend the convex outer margin a little way.

Maxillipeds.—The prismatic inner plates reach as far as or a little beyond the first joint of the palp; the plumose setæ commencing on the inner margin number about ten, the pectinate spines which fringe the apical border number about thirteen; there is also a long submarginal spine-tooth near the inner apex; the outer plates reach beyond the middle of the second joint of the palp, and are fringed along the inner margin, round the apical, and a short way down the outer margin with about thirty-two spines, of which the outer five are setiform, the apical ten elongate, curved, the remainder moderately long, straight, spine-teeth; the first joint of the palp is very short, the second considerably more than twice as long, fringed on the inner border with many slender spines; the third joint much longer than the first, with groups of spines on the inner margin, the adjoining inner surface, and the distal part of the outer margin; the outer distal end is prolonged over the base of the finger in a short, ciliated, round-ended process; the finger is long, with a sharp nail having two or three setules at its base; the dorsal cilium small, near the base of the finger.

First Gnathopods.—Side-plates much outdrawn in front, lower margin carrying some setules. First joint reaching beyond the side-plate, rather broad, widest distally, carrying long setæ on both margins at the upper part, an apical group of pectinate spines on the convexly bent hind margin; a larger group on the hind apex of the short second

joint; the third joint not much longer than broad, with spines on the lower border, which is produced in a short apex behind; the wrist as long as the hand, an apical group on the long front margin, almost all the inner surface covered with rows of long spines, the inner margin with very many groups of long, slightly plumose spines on the outer side, and on the inner side a dense brush of shorter strongly pectinate spines; the hand tending to oblong, widening slightly distally with groups of setiform spines along the serrate hind margin, rows on the inner surface near the centre, and near the front margin a continuous row of small spines, the row curving over to the front margin, in approaching which the spines become very long; four other rows succeed this, the last being apical; the spines appear to be finely pectinate; the convex palm-margin is closely set with short spines, each having an accessory thread near the tip; the nail of the stout curved finger reaches a little beyond the somewhat longer spines which define the palmar margin; the dorsal cilium is small.

Second Gnathopods.—Side-plates narrower than the preceding pair, narrower below than above. First joint similar to that of the first gnathopods but larger; third joint with a few spines on the lower part of the hind margin, which is produced into a conspicuous apex; the wrist short, broader than long, cup-like, with many pectinate spines on the short hind margin and a row along the distal border of the inner surface; the hand large, broader than the wrist, longer than the first joint, with many groups of slender feathered spines along the hind margin, a complete brush of them on part of the inner surface, and some small groups also on that surface near the front margin; the palm-margin has an irregular toothed eminence close to the hinge of the finger, over which the crooked finger bends, leaving a gap between its inner margin and the palm, and within this rises a smaller projection of the palm; the finger closes down against the inner surface between two small processes set upon that surface.

First Peræopods.—Side-plates like those of the preceding segment. The limb slender, first joint reaching beyond the side-plate, longer than the first joint of the second gnathopods, similarly bent and armed; second joint not very short; third joint longer than the fourth or fifth, a little decurrent in front, with slight spines at five points of the front margin, and at six of the hinder; fourth joint a little shorter than the fifth, with slender spines at five points of the hind margin; the fifth joint with spines at six points of the hind margin, and some setæ at two or three points in front; the finger broad, about half the length of the fifth joint, distally broader than the base of the nail, with two setules at the raised point of the inner margin which also has a small cilium before reaching the setules; the dorsal cilium near the base of the finger small.

Second Peræopods.—Side-plates not very broad, the margin of the narrow but deep excavation sinuous, convex at first and then concave. The limb closely resembles that of the preceding pair, but is a little shorter.

Third Peræopods.—Front lobe of the side-plates rounded below, the hind lobe more

deeply produced and pointed. Branchial vesicles oval, descending a little beyond the hind lobe of the side-plate. First joint long and rather narrow, slightly wider above than below; the front margin nearly straight, with some small spines and setæ, the hind margin serrate, continued in a crenate lobe below, partially overlapping the short second joint; the third joint longer than the fourth, equal to the fifth, apically produced, more behind than in front, slender spines at four points on each margin; the fourth joint also distally widened, a little produced behind, and there tipped with spines, of which there are three groups on the front margin; the fifth joint has spines at six points in front, and at four or five behind, of these the apical group being large and strong; the finger as in the preceding peræopods.

Fourth Peræopods.—The side-plates with a minute front lobe, the hinder as in the preceding segment. The limb broader and stronger than the preceding pair, the first and second joints larger but otherwise similar, the third joint more pronounced at the hinder apex, longer than the fifth joint; the fourth joint not at all produced behind, decidedly shorter than the fifth.

Fifth Peræopods.—The side-plates deeper than broad, crenate below. The first joint considerably larger than in the preceding pair, the hind margin more convex, all the joints after the second longer, especially the fourth joint; the fifth joint scarcely so broad, rather more decidedly drawn down at the apex of the hind margin than in the two preceding pairs.

Pleopods.—Peduncles long in comparison with the rami; coupling spines slender, with an apical and a lateral retroverted tooth, and a row of several denticles beginning at the apex and descending one side; cleft spines set far down the joint, six in number on the first two pairs, five on the third, seemingly with nearly equal branches, though as the tips of these branches easily get broken, it is not safe to speak positively on this point; joints of the rami from sixteen to eighteen.

Uropods.—Peduncles of the first pair longer than the rami, with two strong apical spines besides the smaller marginal ones, the rami a little curved, the outer rather shorter than the inner, both with a few marginal spines and a group within the cavity formed by the producing of the outer margin to a point beyond the inner; peduncles of the second pair subequal in length to the rami, which are broader than those of the first pair, but respectively not so long, spined in a similar manner, the outer a little shorter than the inner; peduncles of the third pair shorter than the rami; the rami broad, lanceolate, but with slightly emarginate apices, the outer longer than the inner, equal in length to the outer of the first or the inner of the second pair, with spines at five points on each margin, of which the outer is serrate; each ramus has spines at the apex, the outer has also a group on the outer margin near the apex, otherwise its margins are smooth; the first pair reaches back nearly as far as the third, the second falling short of both.

Telson reaching beyond the peduncles of the third pair, cleft nearly to the base, its

two halves apically a little dehiscent, together forming a broad oval, truncate at the base; on the outer sides, a little above each apex, the convex margin is interrupted and the angle carries a spine and a cilium. The difference between the telson of *Elasmopus subcarinata* and that of *Elasmopus delaplata* corresponds pretty exactly with the difference between the telson of *Mæra rubromaculata* and that of *Mæra bruzelii*.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the third uropods, three-fifths of an inch.

Locality.—Station 320, off Monte Video, February 14, 1876; lat. 37° 17′ S., long. 53° 52′ W.; depth, 600 fathoms; bottom, green sand; bottom temperature, 37°·2. One specimen.

Remark.—The specific name refers to the place of capture off the mouth of the Rio de la Plata.

Genus *Parelasmopus*, n. gen.

Near *Elasmopus*, Costa.

The mandibular palp with the second joint much shorter than either the first or third.

Upper Antennæ with small accessory flagellum.

The *Uropods* of moderate breadth.

The sixth segment of the *Pleon* very small.

It is perhaps doubtful whether this genus should be separated from *Elasmopus*, which in general it so closely resembles, but the proportions of the mandibular palp appear to be unique.

Parelasmopus suluensis (Dana) (Pl. C.).

1852. *Gammarus Suluensis*, Dana, Proc. Amer. Acad. Sci. and Arts, vol. ii. p. 210.
1852. „ *suluensis*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 947, pl. lxv. fig. 3.
1862. *Megamoera Suluensis*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 230, pl. xl. fig. 6.

No rostrum; lateral lobes of the head rounded, lower angles produced in a sharp point which does not project beyond the lateral lobes; seventh segment of the peræon and first two of the pleon distally produced into a small sharp tooth on either side of the median line, the third segment by dorsal emargination of the hind margin forming on each side an angle of the hind margin rather than a tooth, the fourth segment with a long sinuous dorsal line, which at the centre forms two branches, each ending in a sharp upcurved tooth; the first and second segments of the pleon have the postero-lateral angles produced in short sharp points, while the third segment has these angles sharply

produced upwards, with the adjoining part of the lower margin cut into four or five serrations; the sixth segment very small.

Eyes large, oval, placed close to the lateral lobes of the head, the ocelli small, about sixty-six in number, the crystalline cones not longer than broad.

Upper Antennæ much longer than the lower, first joint long and slender, but thicker and a little shorter than the second joint, with three spines along the lower margin; second joint carrying a few groups of slender setæ; third joint less than one-third the length of the second, only a little longer, or not longer, than the first joint of the flagellum; the broken flagellum contained seventeen joints, of which the first was the longest; the secondary flagellum of two slender joints, together a little longer than the first of the primary.

Lower Antennæ slender, the peduncles and flagella respectively shorter and thinner than those of the upper antennæ; first joint little expanded, gland-cone decurrent, produced quite to the distal end of the third joint; fourth joint longer and thicker than the fifth, shorter than the first of the upper antennæ; fifth joint long and slender, furnished like the fourth with some groups of slender setæ; flagellum much shorter than the peduncle, of ten joints, furnished with setæ, the first joint the longest, the last minute.

Upper Lip deeper than broad, with the distal margin rounded, but not broadly, closely ciliated.

Mandibles.—Cutting plate divided into eight or nine teeth; the secondary plate on the left mandible distally broad, divided into six teeth; on the right mandible the secondary plate is slighter, distally bifid, the front tooth the longer, having three teeth along the front side and a little outward-pointing process above them; spine-row on the left mandible consisting of four, on the right of three, curved denticulate spines; molar tubercle with a strongly denticulate crown and a plumose seta; the process near the base of the palp prominent; palp very slender, not so long as the body of the mandible, set just over the molar tubercle, the first joint as long as the third, and double or more than double the length of the second; the second very short, narrower than the first, a little broader than the third; the third narrow, slightly tapering, tipped with two long setæ, or setiform spines.

Lower Lip.—The principal lobes deep, a little narrowed distally, very slightly dehiscent, with many cilia, including a pair on each lobe that are spiniform; the inner lobes deep and narrow, much ciliated on the distal and inner margins; mandibular processes long, narrow, rather divergent.

First Maxillæ.—Inner plate small, ovate, tipped with two plumose setæ; outer plate with seven spines on the truncate oblique distal margin, the denticles minute on the slender innermost spine, prominent on the next three but only two or three in number, while on each of the three outermost spines there is not more than a single

denticle; the first joint of the palp more than half the length of the second, the second broad, with convex outer margin, reaching beyond the outer plate, carrying round the distal margin seven long finely pectinate spines, with four or five submarginal spines.

Second Maxillæ.—The inner plate a little shorter and narrower than the outer, the oblique apical portion fringed with pectinate spines, followed by plumose setæ on the distal part of the inner margin; many long pectinate spines fringe the apical border of the outer plate.

Maxillipeds.—The inner plates nearly reaching the apex of the short first joint of the palp, the truncate distal border sloping inwards, fringed with long spines, some of which are strongly denticulate, the inner part of the apex perhaps having spine-teeth; the outer plates not reaching the distal end of the second joint of the palp, with graduated spine-teeth beginning low down on the inner margin, the lower small, all of them closely set, to the number of twelve on the inner margin, followed by five, long and curved, on the distal border, with a sixth not dentiform; there are also numerous groups of not-tapering spines on the surface near the inner margin; the second joint of the palp is stout, nearly twice as long as the first, fringed with slender spines on the inner margin; the third joint as long as the first, its inner margin finely pectinate, some slender spines around the distal portion, the apex produced on the outer surface into a small oval or conical lobe, finely ciliated, and shown on the Plate as appearing through the transparent finger; the finger with its inner margin finely pectinate, many adpressed cilia on the surface, cilia or setules at the base of the very elongate nail, and a dorsal cilium at a little distance from the base of the finger.

First Gnathopods.—Side-plates not much deeper than broad, a little outdrawn below in front, the hinder part of the lower margin serrate, a few spines and setæ and setules fringing the lower margin; the first joint reaching below the side-plate, not as long as the wrist and hand united, with a few long setæ on the front and hind margins; the second joint short, with two slender spines at the hinder apex; the third joint not much longer, rhomboidal, with spines at two points of the hind margin, a row of ten along the distal margin, with a row of six little spinules above them; the wrist nearly as long as the hand, and distally a little wider, with numerous groups of long pectinate spines on the hind margin and inner surface, and two apical spines on the outer margin; the hand oblong, twice as long as broad, with many groups of long spines on the hind margin and inner surface, and an oblique row along the central part of the inner surface of twenty short spines, continued distally by longer spines; the somewhat oblique palm is well defined, with two or three palmar spines inserted on the surface on each side, among which the finger closes down; the palmar rim is cut into minute erect teeth, and has a fringe of submarginal setæ and setules; the finger has some setules along the inner margin, two longer ones at the base of the long nail; the dorsal cilium is small, at a little distance from the hinge.

Second Gnathopods.—Side-plates a little longer than the preceding pair, which they resemble, except that they are not outdrawn in front. Branchial vesicles as long as the first joint, nearly twice as long as broad. First and second joints of the limb as in the preceding pair, but larger; third joint drawn out to a pointed apex behind as well as in front, with spines at two points of the hind margin; the wrist only equal in length to the preceding joint, broader than long, cup-shaped, with five groups of spines on the short hind margin, and a couple of short spines at the apex of the front margin; the hand of great size, longer than the first and second joints united, much broader than the wrist, nearly twice as long as broad, with a few spines along the long front margin, seven or eight groups of setæ along the shorter hind margin; the palm oblique, of very irregular outline; from the two edges between which the hinge of the finger is inserted arises a large prominence with seven spines, three pairs and an odd one, above its sinuous margin, this prominence being followed by four emarginations, bounded each by a spine, the outermost a very small one, on either side of which there project from the inner surface two processes evidently intended to receive the point of the strong curved finger, as in *Cheirocratus sundevallii;* the dorsal cilium is very small, at some little distance from the base of the finger, the inner margin of which shows some small hairs.

First Peræopods.—Side-plates similar to those of the preceding segment; branchial vesicles more inflated at the centre. First joint of the limb longer than in the preceding pair, with the front margin rather more sinuous, some very long setæ at the upper part of the hind margin; third joint longer than either the fourth or the fifth, not decurrent, with spines at three points of the front margin, setiform spines or spinules at four points of the hind margin; the fourth joint equal in length to the fifth, with spines at four points of the hind margin, spinules at two points of the first; the fifth joint with spines at six points of the hind margin, spinules or small setæ at two points of the front; the finger short and broad, not much more than half the length of the fifth joint, the inner margin forming an angle in front of the little curved nail, two cilia being inserted at this point; the dorsal cilium small, close to the hinge; there is another cilium on the dorsal line near the base of the nail.

Second Peræopods.—The side-plates deeply but not widely excavate. The branchial vesicles at the centre as broad as two-thirds of their length. The limb nearly as in the preceding pair.

Third Peræopods.—Side-plates not very broad. Branchial vesicles widest distally. First joint of the limb much longer than broad, broader above than below, with spines at eight points of the front margin, the hind margin nearly straight, serrate, forming an angle with the serrate hind part of the lower margin; the second joint with a group of spines at the apex of the front margin; third joint with spines at four points of the straight front, and four of the convex hind, margin; the rest of the limb missing.

Fourth Peræopods.—Side-plates narrow. Branchial vesicles smaller than the first joint, in position pointed backwards. First joint similar to that in the preceding pair, but larger, rather more widened at the top, with spines at nine points of the front margin; the two following joints also like those of the preceding pair, but larger, with stronger spines, and the third joint proportionately a little more decurrent both in front and behind.

Fifth Peræopods.—Side-plates small. The first joint larger than in the preceding pair, broader at the centre; the two following joints similar to those of the preceding pair, not larger.

Pleopods.—Coupling spines broad at the base, with from two to three pairs of retroverted teeth below the apex; in the third pair there is a strong spine at the inner apex of the peduncle close to the coupling spines, and many times as long, and another spine about half its length at the outer apex; cleft spines four in number in the first two pairs, three in the third pair, the arms nearly equal in length; the joints were nine to the inner, ten to the outer, ramus of the third pair.

Uropods.—Peduncles of the first pair a little longer than the rami, with several spines along the margins, and some large and strong ones about the apex, the outer ramus a little shorter than the inner, each with a few spines on the margin, and a strong apical group; the peduncles of the second pair a little shorter than the rami; the rami respectively shorter than those of the first pair, but, as well as the peduncles, very similarly armed; the inner margin of the inner ramus more closely spined; third uropods missing.

Telson small, scarcely longer than broad, cleft nearly to the base. The dehiscence boat-shaped, bounded by a sharp apex on either side, while the slightly converging outer lateral margins form two other apices still more produced, each pair of apices having the interval between the two points occupied by two long unequal spines, which extend back much beyond the apices themselves.

Length.—The specimen, in the position figured, measured, from the front of the head to the back of the third pleon-segment, a quarter of an inch.

Locality.—Station 186, between Cape York and the Arrou Islands, September 8, 1874; lat. 10° 30′ S., long. 142° 18′ E.; depth, 8 fathoms; bottom, coral mud. One specimen.

Remarks.—Dana's *Gammarus suluensis* was taken in the "Sooloo Sea; from a small island off the harbour of Soung; among seaweed floating off the shore." He states that "the stylets [uropods] are all long, and extend equally far backwards."

Family Ampeliscidæ.

In 1856 Spence Bate made the Tetromatides the third subfamily of the Gammaridæ, with the single genus *Tetromatus;* in 1857, finding that *Tetromatus* was identical with *Ampelisca*, he altered the name of the subfamily to Ampeliscades. A paper by Costa, of which a preliminary notice had appeared in 1853, was given to the world in full in 1857; in this paper the Ampeliscini were the first subfamily of the Gammaridei, and to it Costa assigned the genera *Ampelisca* and *Araneops*, which are in fact one and the same, but he also noticed that *Haploops*, Liljeborg, ought to be placed in the same group. In 1861 [1] Bate and Westwood call the subfamily Ampeliscides, including in it the genera *Ampelisca* and *Haploops*. In 1865 Lilljeborg made the Ampeliscina the ninth subfamily of the Gammaridæ, with the same two genera. Boeck in 1870 placed the Ampeliscinæ as the sixteenth subfamily of the Gammaridæ, adding *Byblis* as a third genus. With the same genera and with the definition unaltered, in his subsequent work Boeck changed the subfamily into a family, with the name Ampeliscaidæ, which he placed fifth in his arrangement of the Amphipoda Gammarina. In 1882 Sars writes the name Ampeliscidæ instead of Ampeliscaidæ. In 1886 Gerstaecker adopts the title "*Ampeliscina*, Sp. Bate" for the fourth subfamily of the Gammaridæ. The following is the copious definition which Boeck gives of the family :—

"*Upper Lip* broad, apically little arcuate.

"*Mandibles* like one another, apically broad, dentate; the accessory plate also much dentate; the molar tubercle very prominent; spines of the spine-row numerous, long, strong, and apically more or less furcate and sometimes (partim) serrate; the palp more or less elongate, three-jointed.

"*Lower Lip* very broad; the inner plate broad.

"*First Maxillæ* with the inner plate long, but not broad, apically furnished with a few plumose setæ; the palp two-jointed, apically armed with a few strong teeth and spines.

"*Second Maxillæ* with the outer plate longer and sometimes (partim) broader than the inner.

"*Maxillipeds* robust; the inner plate elongate; the outer large, armed on the inner margin with broad teeth, apically with curved spines.

"The body elongate, deep, compressed; the side-plates tolerably large or of moderate size, with setæ on the lower margin; the head apically produced; the eyes two (?) or four, simple.

"The two hinder [fifth and sixth] segments of the pleon coalesced.

"*Upper Antennæ* with a long flagellum, without accessory flagellum, attached to the apex of the head.

[1] In explanation of the fact that Bate and Westwood in 1861 give references to the Brit. Mus. Cat. Amph. Crust. of 1862, it will be remembered that the two works were being produced simultaneously and practically by the same author.

"*Lower Antennæ* also with very long flagellum, attached under the head.

"*First* and *Second Gnathopods* slender, with small, subcheliform hands.

"*First* and *Second Peræopods* narrow; the third joint broad.

"*Third* and *Fourth Peræopods* retroverted; the fingers small.

"*Fifth Peræopods* much shorter than the *Third* or *Fourth;* the first joint much dilated below and behind.

"*Uropods* biramous; the rami of the third pair laminar and setose.

"*Telson* more or less deeply cleft."

In regard to this definition it may be remarked that the likeness between the two mandibles does not extend to the secondary plate, since that on the right mandible is as usual of weaker construction than that on the left; of the third and fourth peræopods it is rather the two terminal joints (and perhaps the third) that are retroverted than the whole of the limb; notice might also well be taken, among the family characteristics, of the gland-cells in the first and second peræopods.

Genus *Ampelisca*, Krøyer, 1842.

1842. *Ampelisca*, Krøyer, Naturh. Tidsskr., Bd. iv. Hfte 2, p. 154.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 912.
1852. „ Liljeborg, Hafs-Crustaceer vid Kullaberg, p. 7.
1853. *Araneops*, Costa, Rend. della Soc. r. Borb.
1854. *Pseudopthalmus*, Stimpson, Marine Invertebrata of Grand Manan, p. 57.
1855. *Ampelisca*, Liljeborg, Om Hafs Crustaceer vid Kullaberg i Skåne, p. 137.
1857. *Tetromatus*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix.
1857. *Araneops*, Costa, Ricerche sui Crost. Amf. Nap., pp. 173, 177.
1857. *Tetromatus*, White, Popular History of British Crustacea, p. 171.
1857. *Ampelisca*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 2, vol. xx. p. 525.
1859. „ Bruzelius, Skand. Amph. Gamm., p. 82.
1860. „ Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 652.
1861. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 125.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 90.
1865. „ Goës, Crust. amph. maris Spetsb., p. 13.
1865. „ Lilljeborg, On the Lysianassa magellanica, p. 18.
1868. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 504.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 276.
1870. „ Boeck, Crust. amph. bor. et arct., p. 141.
1874. „ Buchholz, Die zweite deutsche Nordpolarfahrt, Bd. ii.
1874. „ M'Intosh, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv.
1874. „ S. I. Smith, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv.; Trans. Connect. Acad. Arts and Sci., vol. iii. pt. i. p. 34.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 518.
1878. „ Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 46.
1879. „ Hoek, Carcinologisches, p. 144.
1879. „ Sars, Crust. et Pycn. Nova, p. 454.
1880. „ Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 257.

1882. *Ampelisca*, Haswell, Catal. Australian Crust., p. 234.
1882. „ Sars, Oversigt af Norges Crustaceer, pp. 29, 107.
1884. „ Schneider, Crust. og Pycn. Kvænangsfjorden, p. 120.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, p. 408.
1885. „ Sars, Den norske Nordhavs-Exp., p. 196.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 505.
1887. „ Chevreux, Catal. Crust. Amph. Bretagne, p. 21.

For the original definition of the genus, see Note on Krøyer, 1842 (p. 199); for the definition of *Araneops*, see Note on Costa, 1857 (p. 296); for that of *Pseudopthalmus*, see Note on Stimpson, 1854 (p. 279); and for that of *Tetromatus*, see Note on Spence Bate, 1857 (p. 293). Boeck in 1876 gives the following definition to *Ampelisca* :—

"*Mandibles* with the second joint of the palp broad; the third joint much narrower, but almost of the same length as the second.

"*Maxillipeds* with the third joint of the palp apically much dilated.

"*Eyes* four, placed on the anterior margin of the head.

"*Lower Antennæ* with the first and second joints of the peduncle not externally visible.

"*Fifth Peræopods* with the first joint triangular, elongate behind and below; the fifth joint elongate, oval, longer than the fourth; the finger lanceolate.

"*Third Uropods* extended beyond the extremity of the *First* and *Second* pairs, the rami elongate, laminar, furnished with long plumose setæ.

"*Telson* elongate, more than twice as long as broad, cleft to the base."

The Challenger species do not show the palp of the mandibles in all cases with its second joint broad, or with its third joint[1] almost of the same length as the second, and in one species, *Ampelisca abyssicola*, the fifth joint of the fifth peræopods is shorter, instead of longer, than the fourth.

Spence Bate, in his definition of *Ampelisca* in 1878, includes the character "eyes imperfect," but though the eyes in the Ampeliscidæ are very differently constituted from those of other Amphipoda, it is doubtful whether they should be considered imperfect: behind each of the four bright lenses in the head of an *Ampelisca* there is a circlet of very numerous optical elements (indicated in fig. *a.i.* Pl. CIII.), which are by no means suggestive of imperfect vision.

Ampelisca acinaces, n. sp. (Pls. CI., CII.).

The animal acutely compressed all along the dorsal line, the head elongate, in front narrow and rather sinuously truncate; the postero-lateral angles of the first two pleon-segments rounded, the third segment having the lower margin nearly straight and making almost a right angle with the hind margin; the fourth segment of the pleon having a

[1] Boeck himself finds this third joint only half as long as the second in *Ampelisca eschrichti*.

transverse dorsal depression, which facilitates its telescoping with the segment before it; the partially coalescent fifth and sixth segments have a similar depression between them.

Eyes round, simple, the upper pair near the rounded upper corner of the head, the lower pair close to the lower corners.

Upper Antennæ.—First joint short; second more slender, but much longer, with about a dozen long slender spines on the lower margin; the third joint nearly as long as the first, not distinguishable from the joints of the flagellum, of which there are ten, together longer than the peduncle, having setiform spines on the lower margin.

Lower Antennæ much longer than the upper, about equal to the length of the animal. The first two joints short and comparatively broad, the third a little longer than the second, directed upwards close to the lower margin of the head, beyond which it scarcely reaches; the fourth joint more slender, longer than the whole peduncle of the upper antennæ, with slender spines at a few points of the under margin; the fifth joint thinner and shorter, similarly armed; the flagellum longer than the peduncle, of thirty-four slender joints, armed with slender spines, many of them long.

The *Upper Lip* appears to have distally a faint unsymmetrical emargination, with very slight ciliation.

Mandibles.—The cutting plate bent at almost a right angle to the upper edge of the trunk, divided into five teeth, of which the uppermost extends beyond the rest; on the left mandible there appear to be two extra denticles on this largest tooth; the secondary plate is narrow, apically divided into three, or perhaps five, teeth; it is of slighter structure on the right than on the left mandible, in each being more or less parallel to the principal plate; the spine-row is of thirteen or fourteen closely set, backward-curving spines, which are denticulate and nearly evenly broad till they suddenly narrow to the apex; the molar tubercle is prominent, its oval crown set with strong denticles, and having a long low ridge with an angled margin just above its distal border; a broad process rises beside the base of the palp; the palp is longer than the trunk, set over the molar tubercle, its first joint more than twice as long as broad, its margins carrying two or three small spines; the second joint twice as long as the first, with slender spines at five or six points on each of two edges; the third joint is longer than the first, but shorter than the second, very thin, the hind margin convex, the narrow apex carrying two or three spines, and the straight front margin having three pairs.

Lower Lip.—The principal lobes deeply but not widely divided and strongly ciliated on the inner margins, the ciliation passing round only the inner portion of the rather flatly convex distal margins; the inner lobes reaching nearly as far forward as the principal; the mandibular processes very short, with the narrow rounded apices slightly converging.

First Maxillæ.—Inner plate small, with a short seta or spine on the narrow apex, and a long plumose seta some way below the apex on the inner margin, which below this is

densely ciliated; the outer plate has the inner margin produced into an apical tooth; the truncate slightly convex distal margin carrying eleven spines, of which some, chiefly the outer ones, have lateral denticles, while the inner ones have the two edges serrate; the outer apex of the joint which carries this plate has some small spines; the first joint of the palp is quite short, the second reaches much beyond the outer plate, widening distally, the distal margin cut into five teeth, beside which are planted five spine-teeth, the outermost the longest, and six submarginal elongate spines.

Second Maxillæ.—The inner plate narrow, shorter and narrower than the outer, the lower half of its inner margin densely ciliated, the upper half and apex fringed with strongly plumose setæ or spines; the semicircular apex of the outer plate is fringed with spines, four or five on its outer margin being plumose and more setiform; low down on the outer margin there are one or two small spines.

Maxillipeds.—The basal joint is fringed with setæ, many of them very long and densely plumose. The inner plates are narrow, reaching beyond the first joint of the palp, the distal margin serrate, sloping outwards, carrying three spine-teeth near the inner apex, which are almost concealed from the inner view by a row of five or six long plumose setæ crossing the surface; the outer plates large, reaching almost to the apex of the second joint of the palp, the lower part of the inner margin smooth, with two or three small spines upon or near it, the upper part strongly crenate and carrying six strong spine-teeth, somewhat spoon-shaped in outline; round the apical margin there are five longer spines, the outermost being the narrowest; the first joint of the palp is short, the second long, the inner margin fringed with long spines; the third joint longer than the first, narrowest at the base, the inner margin and apex fringed with spines, of which there are groups also on the surface; the spines on the inner margin appear to be plumosely pectinate in the lower half; the finger is small, little curved, with a rather long nail, near which on the inner margin the finger has some four decurrent spinules or setules; the dorsal cilium is small, near the hinge.

First Gnathopods.—Side-plates much wider below than above, the rounded lower corner in front being produced over the basal joints of the lower antennæ, the lower margin fringed with numerous long plumose setæ and some shorter smooth setæ inserted more deeply; the smooth hind margin forms apically a small tooth which does not reach beyond the lower margin. The first joint not reaching below the side-plate, a little widened distally, with short setæ on the front margin, long ones on the surface, long and short on the hind margin; the second joint short, with a group of apical spines behind; the third joint oblong, with the front apex pointed, the hinder rounded and fringed with long spines; the wrist longer and wider than the hand, widest after it becomes free from the third joint, the front margin carrying six or seven groups of spines, almost all the free hind margin crowded with slender pectinate spines of very various lengths, the apex having some very short by the side of some that are very long; the hand a narrow oval,

with half a dozen groups of setæ or spines on the front margin, many spines on the apex, and eleven groups of spines on the hind margin, in character resembling the series on the wrist; the finger slender, curved, a little more than half the length of the hand, with six or seven decurrent spinules along the inner margin, the nail short; the dorsal cilium spine-like, placed near the hinge.

Second Gnathopods.—Side-plates long, widening a little below, carrying on the surface some vertical streaks, the lower margin fringed and the hind margin apically toothed as in the preceding pair. The branchial vesicles not very broad, but as long as the side-plates. The marsupial plates shorter and much narrower than the branchial vesicles, fringed with very long setæ. The first joint reaching perhaps a little below the side-plate, curved, expanding distally, the front margin sinuous, with some long setæ both above and below and short spines in the middle; the hinder margin carrying numerous long setæ, the lower ones plumose; the second joint with a seta in the middle of the hind margin and a group at the apex; the third joint nearly oblong, narrowing apically, with a few spines along the hind margin and an apical group; the wrist very long and narrow, much longer than the hand, armed as in the first gnathopods, but with the groups in front more numerous, behind less closely set, and the spines longer; the hand longer and narrower than in the first gnathopods, the margins similarly armed, the inner surface closely set with rows of spines; the finger longer than in the preceding pair, but otherwise like it.

First Peræopods.—Side-plates nearly as in the preceding pair, but with less difference in width above and below. First joint not reaching the end of the side-plate, a little curved and slightly expanded distally, the upper part of the hind margin bare, the lower carrying long setæ; the second joint short; the third long and broad, with very long plumose setæ on the lower half of the front and more than the half of the hind margin; the fourth joint scarcely longer than broad, much narrower than the third joint, with many long setæ on the hind margin, and two small spines at the apex of the front; the fifth joint somewhat oval, much longer than the fourth, with the long plumose setæ on both margins except at the proximal part, eight on the hind margin, and twice that number on the front; the finger slender, curved, with smooth edges, much exceeding in length the fourth and fifth joints united.

Second Peræopods.—Side-plates broad, with many of the vertical striations which seem to occur generally on the side-plates in this genus, the front margin slightly convex, the lower margin nearly straight, fringed, but not closely, with setæ and spinules, the excavation behind not deeper than broad, the hind margin below the prominent rounded angle sloping forwards with a slight concavity, and merging without any intervening tooth in the lower margin. The branchial vesicles as in the two preceding pairs. The marsupial plates narrow, as long as the branchial vesicles. The limb differs in some respects from that of the preceding pair; the second joint has the hind margin

fringed with plumose setæ; the third joint is longer, and strongly fringed with long densely plumose setæ along the whole of both margins, it is slightly less broad at the distal end than higher up; the hand is rather longer, and the finger not being longer is therefore less in excess of the length of the two preceding joints united.

Third Peræopods.—The side-plates broad but shallow, the hind lobe less deep than the front, and having the hind margin of the first joint attached to it. The branchial vesicles not very large, bent forwards across the first joint, with the upper edge concave. The marsupial plates narrow and short, with seven long setæ about the distal end. The first joint of very irregular shape, the greatest breadth about equal to the length, the front margin describing a great curve, which ends near the apex of the second joint; it has several spines at intervals, and long plumose setæ inserted either on the margin or at some distance within it; the hind margin is short and smooth, almost straight, scarcely reaching the top of the second joint; the second joint is short, partly covered in front by the lower lobe of the first joint; it has an apical spine and spinule; the third joint has the appearance of being reversed, the hind margin being straight, with two small apical spines, the front margin very convex, with some spines of different lengths, the apex a little decurrent but not pointed; the fourth joint is longer, with parallel sides, the front fringed with spines, the hinder straight and smooth, but its slightly decurrent apex carrying a notable group of spines of very various lengths, some of which have for part of their length three lines of denticles; besides eight stout spines, there are three slender ones, the terminal part of the longest delicately pectinate; the fifth joint is rather longer than the fourth but more slender, straight, the longer front margin with its apex produced below the insertion of the finger, and armed with a dozen long spines, most of them partially pectinate; there is also a long spine at the apex, beside two or three spinules; the hinder margin, which is straighter than the front, has seven spines, of successively greater length; the finger is very short, abruptly upturned, with a small dorsal cilium close to the hinge, and on the middle of the back a group of many little denticles.

Fourth Peræopods.—The side-plates very shallow, not lobed, but deeper in front than behind, where they form a rounded point. The branchial vesicles small, placed as in the preceding segment. The first joint of the limb large, projecting in front above, with feathered setæ round the prominent corner, the long margin below this almost straight, having small spines at intervals, its lower lobe overlapping the second joint to its apex; the hind margin curved above and below, but for the chief part nearly straight and smooth, the lower margin behind standing clear from the next joint; the next two joints as in the preceding pair; the fourth joint rather wider distally, the hinder apex similarly armed, the front margin with stronger spines; the fifth joint is set on, as in the preceding pair, near the front apex of the fourth joint; it has seven spines, rather stout but not elongate, along the front margin, and some on the apex; there are three on the hind margin; the finger is as in the preceding peræopods.

Fifth Peræopods.—Side-plates shallow and not very broad, with two setæ and a small spine on the convex lower margin; at the narrow line of attachment, both in this and other species of the genus, these side-plates seem to be almost coalesced with the segment. The first joint with the front margin nearly straight, carrying nine spinules and an apical spine; the lower margin, after passing across the top of the second joint, abruptly descends along the back of it, but before reaching the end curves up again, and with a slightly convex course, closely fringed with long plumose setæ, makes an obtuse angle with the slightly convex, backward-tending, smooth hind margin, the greatest breadth of the joint being at the angle; on a large part of the inner surface of this great wing there are long setæ; the second joint with the sides almost parallel, the front margin a little decurrent, with an apical spine, and two spinules; within the apex there are three spinules on the lower margin; the third joint is shorter than the second, especially behind, where it has two or three long setæ and two or three spines; in front its apex is decidedly decurrent, set about with three or four slight spines; the fourth joint is longer than the third, shorter than the second, widening distally, the apex behind slightly decurrent, carrying a spine; the apex in front more decurrent, with several spinules on the lower margin within the apex; the fifth joint is nearly as long as the three preceding joints united, broader above than below, the front and hind margins slightly convex, smooth, the lower margin obliquely truncate, the surface having some short submarginal spines and some spinules difficult to discern, and there are some at the apex; the finger is much narrower, but with something of the same laminar appearance, and about three-quarters of its length, lanceolate in shape, with very little firmness of texture; there is a small seta near the hind margin below the middle.

Pleopods.—The coupling spines broad at the base, having a lateral tooth much stronger than the apical on one side, and on the other a succession of small teeth; the peduncles have also groups of long plumose setæ; the inner ramus of the first pair has on its long first joint a plumose seta followed by six cleft spines, with the outer arm clearly serrate on the inner edge; this joint has also four plumose setæ below the cleft spines; there are twenty-eight joints on the outer ramus of this pair, and twenty-two on the inner.

Uropods.—The peduncles of the first pair are shorter than the rami, with small spines along the upper margins, the rami are slender, reaching little beyond the peduncles of the second pair, the outer rather the shorter, each curving to the acute apex, the inner carrying a few spinules on the margins high up, and some minute surface spines; the peduncles of the second pair nearly as long as the rami, with spines along the upper margin; the inner ramus rather longer than the outer, with thirteen spines along the serrate upper margin, which is apically curved and acute; the outer ramus has sixteen spines on the serrate upper margin of the outer surface, and side by side with these on the inner surface another row of eleven or twelve, more decurrent, the last five long, and with the apical

portion denticulate; the peduncles of the third pair much shorter than the rami, apically acute below, with a spine and some spinules on the upper margin; the rami lanceolate, subequal, reaching much beyond the preceding pair, carrying marginal spines of various kinds, some being slender and setiform.

Telson subequal in length to the peduncles of the third uropods, cleft for three-quarters of its length, the cleft nowhere dehiscent; the outer margins converging little for the first two-thirds of the telson's length, then rapidly; a feathered cilium and lower down an apically plumose spine or seta are inserted on the margin just before the apex is reached; the surface on either side has five spines or setules.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the apex of the third uropods, seventeen-twentieths of an inch.

Locality.—Station 163B, Port Jackson, June 3, 1874; depth, 35 fathoms; bottom, hard ground; bottom temperature, 63°·0. One specimen, female.

Remark.—The specific name, derived from the Latin word *acinaces*, a Persian sabre, refers to the sharp curved dorsal outline of the animal.

Ampelisca chiltoni, n. sp. (Pl. CIII.).

The acuteness of the dorsal compression seems to be limited to the head, which is truncate in front; the posterior lateral angles of the third pleon-segment produced in a small acute point; the fourth segment having a small transverse dorsal depression, beyond which the dorsal line is rather sinuous, ending in an angular apex; the dorsal division between the fifth and sixth segments is very slightly marked; the dorsal line of the sixth segment divides at about the centre, forming two small wings, the median line convex, the wings straight at the top, ending angularly on each side of the telson, the postero-lateral angles sharply produced at the base of the uropods, and furnished with spines, the lower margins carrying plumose setæ.

Eyes and *Antennæ* nearly as in *Ampelisca acinaces*. In one specimen examined there were twenty-eight joints on the flagellum of the lower antennæ; the first two joints of the peduncle appeared rather more dilated than in the compared species, the flagellum also being shorter.

Upper Lip.—The distal margin of the inner plate flatly convex, ciliated, with a faint emargination not central; the outer plate broader, with an almost semicircular outline, and a faint distal central emargination.

Mandibles similar to those of *Ampelisca acinaces;* but the spine-row consists of ten spines; the molar tubercle has a tooth on the forward side; the margin of the crown is set with strong denticles in the left mandible on the inner side only, the opposite side

being divided into three strong simple teeth ; on the third joint of the palp there are four pairs of spines to the front margin and a pair on the apex.

Lower Lip.—The principal lobes broad, the distal margins broadly convex ; the inner lobes rather tumid, distally well ciliated ; the mandibular processes small and little prominent.

First Maxillæ.—Inner plate apically narrowed, and carrying on the apex two small plumose spines or short setæ, the outer a little longer than the inner ; the eleven spines on the outer plate are not very dissimilar to those of *Ampelisca acinaces ;* the inner ones have lateral denticles instead of serrate edges, but possibly in the other species the denticles have been worn or accidentally broken off ; the second and third of the innermost have, however, in this species their concave inner edges smooth ; the palp has the distal edge of the second joint cut into sharper teeth and bordered with sharper and longer spine-teeth than in the other species ; there are eleven submarginal spines.

Second Maxillæ.—Rather below the middle of the inner margin of the inner plate begins a row of about thirteen long plumose setæ, which cross the surface a little below the apex ; another row begins nearer to the apex, which itself is narrowed, sloping outwards, fringed with many long spines ; the inner plate is longer than the outer, wider towards the apex, which has an outward sloping curve, and is fringed with very many long spines.

Maxillipeds resembling those of *Ampelisca acinaces*, but with the distal margin of the inner plates more squarely truncate ; the outer plates with nine spoon-shaped spine-teeth on the inner border, and six spines on the broad indented distal margin, the two outermost being plumose, setiform ; the second joint of the palp is long, crowded with spines on the inner margin and apex, and also has a single spine on the outer margin below the centre ; the third joint is widest not far from the base, and then narrows to the broad flat apex, round which and the inner margin there are many spines ; the finger is inserted far below the apex ; it is very narrow, and has a long thin nail which constitutes nearly half its total length ; on the inner margin near the base of the nail it has about four decurrent spinules ; the dorsal cilium is small, near the hinge.

First Gnathopods like those of *Ampelisca acinaces*, differing as follows :—The side-plates are much less widened below, the hind margin is straight with no concavity, though it may be noticed that it has the little terminal tooth ; the setæ that project below the lower margin are here less regularly set on the surface ; the second joint has spines at two points of the hind margin above the apex ; the third joint has very numerous spines along the hind margin, and a row which crosses the surface above the apex ; there is a long row of long spines on the inner surface of the wrist ; the hand is a little more dilated near the base, and the spines on the inner surface seem to be more numerous than in the other species.

Second Gnathopods.—Side-plates a little dilated below, the hind margin nearly

straight, with a small apical tooth. The branchial vesicles broad, not quite so long as the side-plates. The marsupial plates narrow, longer than the branchial vesicles. The first joint not reaching the end of the side-plate, the setæ on its hind margin of great length; the second joint having setæ or spines at three points of the hind margin; the rest of the limb nearly as in *Ampelisca acinaces*, but narrower, with more spines on the hind margin of the third joint; the hand less than half the length of the wrist, set over the inner surface with many rows of short spines; six of the spinules which fringe the inner margin of the narrow finger are spinous on two edges, the seventh, which lies beside the nail and is of equal length with it, appears to be smooth.

First Peræopods.—The side-plates of nearly equal width throughout, the hind margin without an apical tooth. The branchial vesicles broad, longer than the side-plates. The marsupial plates narrow; longer than the branchial vesicles. The limb differing little from that of *Ampelisca acinaces;* the hind margin of the first joint more convex; the third joint apically narrower; the fourth joint with many long setæ on the hind margin, and at the apex of the front one long and one short seta; the fifth joint fringed with setæ and slender spines along more than half the convex front margin, but with only two straight slender spines standing out from the hind margin; the finger a little longer than the two preceding joints united.

Second Peræopods.—Side-plates with the front margin very slightly convex, the excavation behind of little depth, the hind margin below the acute upturned angle being nearly as long as the front margin. The first joint of the limb about reaching the end of the side-plate, fringed with numerous setæ, those in the middle of the hind margin being longer than those lower down; the second joint having the hind margin fringed with plumose setæ; the third joint longer than in the preceding pair, densely fringed on both margins; the short fourth joint fringed on the hind margin except near the base, and with an apical group in front; the fifth joint having spines or setæ along the lower half in front, and on the hind margin three slender spines, each with an attendant spinule; the finger longer than the two preceding joints united, a short dorsal cilium close to the hinge; as in the preceding species, there is on the front margin of the third joint a series of long setæ strongly but loosely feathered, and another series densely feathered.

Third Peræopods.—Side-plates broad but not deep, the front lobe wider and rather deeper than the hinder one. The branchial vesicles small, bent forwards across the first joint, but not reaching the front of it. The marsupial plates short and narrow, with nine setæ. The first joint large, its greatest breadth exceeding the length, the front margin describing an immense curve, fringed, except at the lower part, with some setæ and small spines, the hind margin double, nearly straight, as if soldered above to the side-plate, neither this nor the front margin at all overlapping the short second joint, which has a couple of spinules on the front apex; the third joint once and a half the length of

the second, with a spinule on the straight hind margin and another at its apex, the convex front margin having several slender setiform spines, and a strong apical spine; the fourth joint longer than the fifth, broad and straight, fringed in front with slender spines, and having at the apex a long strong one; within the smooth hind margin there are three groups of short spines, and a complex apical group with three slender spines, four short stout ones, and one or two that are long and stout; the fifth joint with eighteen slender spines or setæ along the serrate front margin, some long spines on its produced apex, the hind margin straight and smooth; the finger very short, abruptly upturned, with a dorsal cilium and a dorsal denticle.

Fourth Peræopods.—The side-plates deeper in front than behind, with some feathered setæ on the lower part of the front margin and the hinder part of the lower margin. The branchial vesicles as in the preceding segment, but rather smaller. The first joint larger than in the preceding pair, its greatest breadth equal to the length, in front projecting in a great rounded angle, the sides of which are straight, the lower side longer than the upper; about the angle there are some feathered setæ, and spinules on other parts of the margin; the apex forms a narrow, scarcely decurrent, little lobe; the hind margin is much and evenly curved, armed with a few spinules; the second and third joints are much as in the preceding pair; the fourth joint is strongly spined along the front margin, having five long spines, and a dozen others smaller, of different lengths; within the hind margin are several short spines on the surface, the apical group being in general as in the third peræopods, the two long spines being denticulate in the lower portion; the fifth joint is longer than in the preceding pair, but still not quite so long as the fourth; its serrate front margin and apex carry eighteen long spines; the hind margin has one submarginal spine; the tiny finger has three dorsal denticles, its distal half abruptly narrower than the proximal, and carrying two little curved dorsal setules, possibly marking the base of a nail.

Fifth Peræopods.—The side-plates shallow, the lower margin preceded by plumose setæ, and fringed with slender spines. The first joint with the front margin nearly straight, armed with eleven spinules; the lower margin crossing the top of the second joint, behind descending much below it; the hind margin smooth, sloping backwards with a gentle convexity to join the upward curve of the lower margin, the whole free part of which is densely fringed with plumose setæ; the greatest breadth of the joint is at the meeting of the hinder and lower margins; there are many long setæ on the inner surface; the second joint is short, with two or three small apical spines in front; the third joint is longer than the second, the decurrent apex in front having four small spines; the hinder apex acute, much more decurrent; the hind margin fringed with about a dozen long plumose setæ, of which one on the apex is of great length; the fourth joint longer than the third, with some short spines on the hinder apex, the front margin very convex, with five groups of short spines on the surface near it, a spine and spinules

on a quasi-apex, beyond which the true apex is decurrent, and has on its lower or inner margin four short but strong spines; the fifth joint scarcely longer than the fourth, narrower at the base than elsewhere, laminar, with the front and hind margins smooth, slightly convex, the distal margin obliquely truncate, having four small sharp spines with accessory threads at the front, and two or three at the back; the finger lanceolate, as long as the fifth joint, with a short setule at the back where the narrow sharp nail commences.

Pleopods.—The coupling spines sinuous, with a large lateral retroverted tooth on one side, and on the other a row of six or seven small teeth succeeding the apical tooth; there are also many plumose setæ on the peduncles; the cleft spines numbered six in the ramus examined, the longer arm being obviously serrate on the inner side; the outer ramus had twenty joints.

Uropods.—The peduncles of the first pair a little shorter than the longer ramus, with many spines along the upper margins, and a submarginal series near the lower border; on the inner distal margin there is a small tooth and a long spine; the rami are slender, somewhat curved, apically acute, the lower longer than the upper, but much less conspicuously spined; the peduncles of the second pair quite as long as the rami, reaching much beyond those of the preceding pair; of the upper edges the inner has many spines, the outer few but longer ones; the rami are broad, reaching little beyond the preceding pair, the upper rather longer than the lower, both with curved acute tips, the upper edges fringed with many spines, the lower ramus having a second series ending near the apex with a spine of great length, distally denticulate; the peduncles of the third pair much shorter than the rami, apically produced below, the upper margin carrying a small group of spines; the rami lanceolate, subequal, reaching much beyond the other pairs, the upper one with its upper margin smooth, except for a small feathered spine near the top, the lower margin serrate, armed with spines and feathered setæ, the lower ramus rather the longer, serrate on both margins, setiferous.

Telson longer than the peduncles of the third uropods, nearly twice as long as its greatest breadth, cleft for more than three-quarters of its length, not dehiscent, the sides at first almost parallel, then converging gently to the distal end; the apices slightly emarginate, each having a spine and a cilium, the inner corner slightly more produced than the outer; several small spines are dotted about the surface of the telson.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the apex of the third uropods, three-fifths of an inch.

Locality.—Station 167, off New Zealand, June 24, 1874; lat. 39° 32′ S., long. 171° 48′ E.; depth, 150 fathoms; bottom, blue mud. Four specimens.

Remark.—The specific name is given in compliment to my obliging friend, Mr. Charles Chilton, of New Zealand, who is doing so much good work upon the Sessile-eyed Crustacea.

Ampelisca abyssicola, n. sp. (Pl. CIV.).

The back of the peræon and first three pleon-segments rounded, the head dorsally compressed, in front a little emarginate at the top, so that the lower part forms a slightly prominent lobe of irregular outline on either side, sloping backwards below; the postero-lateral angles of the first two pleon-segments rounded, of the third not rounded, but not produced or upturned; the fourth segment carinate, the carina interrupted by a transverse dorsal depression, and having a small tooth almost at the distal end; the fifth and sixth segments coalesced, the dorsal point of division depressed, very faintly marked, the segments slightly carinate, the after part of the sixth segment forming a free angle on each side of the central dorsal line, which has a pair of setules; the postero-lateral angles are sharply produced.

No *Eyes* of the character usual in the genus *Ampelisca* could be discovered.

Upper Antennæ not nearly reaching the end of the peduncle of the lower; the first joint moderately thick, with setules along the central part of both margins, and some slender spines near the narrowed apex; the second joint longer and thinner than the first, not so long as the head, with thin spines chiefly along the lower margin; the third joint rather more than a quarter the length of the second, quite distinct from the flagellum, with spines at two or three points of the lower margin; the flagellum shorter than the peduncle, with ten joints in one antenna, eleven in the other, the joints slender, all but the last widening a little distally and armed with spines longer than themselves, the terminal joint with three not longer than itself.

Lower Antennæ.—The first two joints very short, the second with a small lobe on the side not pointing forwards, its distal margin produced into two points, one of which is very acute; the third joint as long as the two preceding united, with one margin straight, the other convex; the fourth joint long and narrow, with a few spinules on the lower margin and the surface; the fifth joint rather longer, with a slight curve, similarly armed; the flagellum slender, with fifteen joints remaining, which are tipped with spines, those on the second, fourth, sixth, ninth, twelfth, and fifteenth being long ones.

Upper Lip.—The inner plate projecting, rather strongly ciliated near the rounded corners of the distal margin, which centrally is almost straight; the outer plate is much wider, transversely oval, with the distal margin flattened, straight, and smooth.

Mandibles.—All the cutting plates strong except the secondary plate on the right mandible, of which the teeth are sharp and almost spine-like; the outer plates have four or five strong teeth apiece; in the spine-row there are on the left mandible eight strongly denticulate backward-curved spines; on the right mandible there are nine, rather longer and less curved; the molar tubercle is strong, with an irregularly shaped crown set with little teeth; the palp is strong, with a rather short first joint set as usual low down on the outer side of a high, broad, somewhat folded process which looks like a

joint, and which has a small secondary process projecting from its inner surface; the second joint is long and broad, at the base projecting over the first joint in front, its hind margin slightly concave, carrying spines at seven points, the front margin fringed with stiffer spines, which towards the slightly narrowed truncate apex are of great length; the third joint moderately broad, though a good deal narrower than the other two, longer than the first, considerably shorter than the second, with two groups or rows of spines near the top of the hind margin, three or four groups along the front, and some strong spines on the slightly rounded apex, one of the spines being conspicuous among the rest for its size.

Lower Lip much the same as in *Ampelisca chiltoni*.

First Maxillæ.—The inner plate rather long, with a plumose seta on the inner margin below the apex, and a shorter spine or seta on the apex as in *Ampelisca acinaces;* of the eleven spines on the outer plate the innermost, which is as usual straight, has three tiny denticles some way below the apex on the inner margin, the next has two denticles on the outer margin, the rest, except the outermost, being more or less denticulate, but none strongly, so that the spines appear smooth except under a high power; the second joint of the palp is strong, nearly parallel-sided, its distal teeth acute, and the five spine-teeth slender; there are seven or eight submarginal spines.

Second Maxillæ differing little from those of *Ampelisca chiltoni*.

Maxillipeds in general like those of *Ampelisca chiltoni*, but resembling *Ampelisca acinaces* in having the distal margin of the inner plates sloping outwards; the plumose setæ descending to nearly the middle of the inner margin; the large outer plates have from eleven to twelve or thirteen spine-teeth along the inner margin, and eleven spines on the broadly convex distal margin, the outer six of the latter being rather setiform; the third joint of the palp is shorter than in *Ampelisca chiltoni*, with numerous and strong spines on the surface as well as the inner margin and apex and upper part of the outer margin; the finger is longer than the third joint, and has six long decurrent spinules on the inner margin as it approaches the nail, which constitutes about half the length of the finger.

First Gnathopods.—Side-plates directed forwards so as to cover the basal joints of the lower antennæ, rather wider below than above, the lower margin very convex though irregularly, with the usual setæ, the lower row inserted with some regularity; the hind margin is slightly convex, and below curves round to a small apical tooth. The first joint not reaching the end of the side-plate, proximally narrow, but for the most part very wide, with the usual armature; the second joint broader than long, with one or two small spines low down on the hind margin and an apical group of plumose setæ; the third joint broad, widening distally, its hind margin fringed with plumose setæ and spines; on the inner surface transverse rows of long spines are inserted at various heights above the apex; the wrist is of great breadth, where free from the third joint its

breadth being about half its total length, the hind margin crowded as usual with spines, many of them conspicuously pectinate at the centre, the inner surface having a series of spines down the centre and another close to the front margin; the hand, which is as long as the free hind margin of the wrist, has its greatest breadth near the base; both margins are armed with many spines; a dozen spines are arranged along the centre of the inner surface; the finger is narrow, much curved, much more than half the length of the hand, and inserted close to its hind margin; the inner margin of the finger fringed with eight or nine microscopically feathered spinules; the nail long but not nearly half the total length of the finger; the dorsal cilium at a little distance from the hinge.

Second Gnathopods.—Side-plates directed forwards, not wider below than above, the hind margin almost straight, curving a little to the small apical tooth. The branchial vesicles broad, not so long as the side-plates. The marsupial plates narrow, longer than the branchial vesicles. The first joint curving forwards, expanding distally, both margins fringed almost throughout with long setæ; the second joint with two or three spinules on the hind margin; the third joint with two convex margins converging to the pointed apex, the spines on the inner surface near the front margin being more numerous than those on the hinder margin; the front margin of the wrist nearly straight, and the free portion of the hind margin only slightly convex, fringed as usual with many spines; on the inner surface are several small groups of spines near the front margin, and larger groups along it nearer the centre, set obliquely; the hand is much more than half the length of the wrist, but not so long as its free hind margin; its greatest width is not far from the base, where the spines of the hind margin begin and may be considered as defining a palm; besides the usual spines of the margins and apex, the inner surface is thickly set with rows of pectinate spines, except near the base and along the hinder part, which has only a few scattered spines; the finger is narrow, much curved, closely resembling that in *Ampelisca chiltoni*, not reaching the end of the palm-margin.

First Peræopods.—Side-plates directed forwards, of even breadth throughout, the hind margin ending in a small apical tooth. The branchial vesicles and marsupial plates like the preceding pair. The first joint long and rather narrow, curved forwards, reaching a little beyond the side-plates, with some very long setæ on the middle of the convex hind margin; the second joint short, with one or two apical spinules; the third long and almost parallel-sided, with marginal spinules and long feathered setæ at seven or eight points on each margin, the upper part of the front margin quite smooth; the fourth joint short, the hind margin fringed as usual, the front having three apical setæ, of which one is much longer than the following joint; the fifth joint apically narrower, twice as long as the fourth, with feathered setæ at six points of the convex front margin, a spine and a seta at three points of the sinuous hind margin; the finger slender, curved, a little longer than the two preceding joints united.

Second Peræopods.—The side-plates directed forwards like the three preceding pairs, the front margin nearly straight; the long lower margin very slightly fringed, sloping rather sharply upwards, and almost continuous with the short piece of the hind margin which slopes sharply forward below the prominent angle of the excavation, which is deeper than broad. The branchial vesicles and marsupial plates much as in the preceding segments. The first joint reaching a little below the side-plates, the hind margin fringed, except at the upper part, with many plumose setæ, the front margin free above for a short space, then armed with spines, and below with plumose setæ; the second joint bearing four long plumose setæ on the hind margin; the third joint longer than in the first peræopods, densely fringed on both margins; the fourth joint as in the preceding pair; the fifth joint more than twice as long as the fourth, the three setæ of the hinder margin being on its upper half; the finger very little longer than the two preceding joints united.

Third Peræopods.—The side-plates broad, not very deep, the front lobe deeper than the hinder, both unfringed. The branchial vesicles not large, directed more downwards than forwards. The marsupial plates short and narrow, with seven long setæ. The first joint large, its front margin forming a great bend, what may be called the angle of the curve being nearer the distal end than the base; along some of the lower part plumose setæ project from the inner surface, along the upper part there are spinules; the double hind margin is in each case nearly straight above and bent below; the short second joint, which is partially overlapped in front by the first joint, has one or two apical spinules; the third joint has three very slender spines on the convex front margin, a strong bent spine at its apex, and a spinule at the apex behind; the fourth joint is straight, much longer than the fifth, or than the two preceding joints united; it has along the front margin and apex thirteen long slender spines, distally pectinate, one at the apex being thicker than the rest; near the smooth hind margin are some minute surface spines, its slightly produced apex carrying the usual mixed group of spines, one nearly as long as the following joint, distally denticulate, three others shorter in various degrees, of the same character, three very short but stout, three long and very slender; the fifth joint is narrow, and has on the serrate front border sixteen long and slender spines, two rather stronger on the produced apex, and on the hind margin two spinules; the minute upturned finger has two or three dorsal denticles.

Fourth Peræopods.—Side-plates small, with a couple of setæ on the hinder part of the lower margin. The branchial vesicles small, bent down and a little forwards. The first joint of the limb shaped as in *Ampelisca chiltoni;* on the most prominent part of the front margin there are seven plumose setæ close together; on the surface behind there are many slender setæ remote from the margin; the second joint has an apical spine and two spinules in front; the third has three slender spines along the scarcely convex front margin, and at its apex a stronger spine and two spinules, also a small spine at the apex

of the hind margin; the straight fourth joint is longer than the fifth, and has in front five large spines of graduated size, besides thirteen other spines and spinules; there are a few small spines on the surface near the smooth hind margin, the apex of which has the usual group; the fifth joint has ten strong spines on the serrate front margin, one on the produced apex, accompanied by a spinule and two long slender spines; the tiny upturned finger has a dorsal cilium close to the base, and two or three dorsal denticles a little way from it, the narrow part of the finger being longer than the thicker proximal part.

Fifth Peræopods.—Side-plates very small, narrowed behind, the lower margin carrying setæ on the front and spines on the after part. The first joint very similar to that in *Ampelisca chiltoni*, but the lower margin even more drawn down behind, and the hind margin forming an even more continuous curve with the lower; the second joint with two or three small spines on the front apex, the hind margin rather longer than the front one; the third joint scarcely longer than the second, the hind margin carrying five long feathered setæ, each apex a little decurrent and armed with some small spines; the fourth joint longer than the preceding two united, or than the fifth, its hind margin slightly concave, with an apical group of spines and a seta, the front margin convex, with short surface spines dotted about near it, a spine and two setules at the quasi apex, and some small spines on the serrate lower margin within the decurrent incurved true apex; the fifth joint almost oval, with two spines at the apex behind, and seven or eight round the apex in front, both margins smooth, but the surface near the hind margin marked as if for the insertion of some eight spines or setæ; the lanceolate finger has six or seven similar marks, its hind margin more convex than the front, and a suddenly narrowed tip, less than a fourth of its total length, at the base of which two setules are inserted; the finger is a little shorter than the hand.

Pleopods.—The peduncles have many plumose setæ; the coupling spines were not examined; on the first joint of the inner ramus of one pair, probably the third, there were four cleft spines, with one plumose seta above and four below this series; the joints of the inner ramus numbered nineteen, of the outer twenty-three.

Uropods.—The peduncles of the first pair rather longer than the rami, with spines as in *Ampelisca chiltoni*; the rami with the apices curved, acute, the marginal spines not numerous, the lower ramus the longer; the peduncles of the second pair a little longer than the rami, the upper ramus very little longer than the lower, the marginal spines less numerous than in the species just mentioned, the long one near the end of the lower ramus strongly denticulate; the peduncles of the third pair as in the preceding species; the rami lanceolate, the upper noticeably longer than the lower, both of them serrate on both margins and furnished with spines and plumose setæ.

The Telson equal in length to the peduncles of the third uropods, not twice as long as broad, the sides nearly parallel for the first half, then gently curving to the broad apices, which are sharp at the inner corner, at the outer carrying a spine with accessory thread

and a setule; the cleft is nearly four-fifths of the total length of the telson, the surface has on each side a couple of slender spines near the top, and low down two stouter ones.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the apex of the third uropods, thirteen-twentieths of an inch.

Locality.—Station 24, off Culebra Island, St. Thomas, March 25, 1873; lat. 18° 38′ 30″ N., long. 65° 5′ 30″ W.; depth, 390 fathoms; bottom, Pteropod ooze. One specimen, female.

Remarks.—The specific name refers to the considerable depth from which the species was obtained.

The present species bears a great external resemblance to *Ampelisca odontoplax*, G. O. Sars, taken in the Norwegian North Atlantic Expedition, "off the coast of Helgeland (Station 147), at a depth of 142 fathoms"; the station referred to being in lat. 66° 49′ N., long. 12° 8′ E.; but in that species the two pairs of gnathopods are described as "very slender, with the hand very small and narrow," and the first joint of the fifth peræopods is said to be at the extremity "almost vertically truncate," this expression referring to the lower margin behind, which in the Challenger species is very much rounded. In Sars' figure the fifth and sixth pleon-segments are drawn as distinct, not coalesced, but the circumstance is not referred to in the text. According to Buchholz, Die zweite deutsche Nordpolarfahrt, 1874, p. 357, these segments are distinct in *Ampelisca eschrichtii*, Krøyer.

Ampelisca fusca, n. sp. (Pl. CV.).

Head sharply compressed on the dorsal line, in front emarginate at the top; from the lower angle of the emargination the sides slope backwards with a slightly sinuous outline; the back is rounded as far as the third pleon-segment, which with the fourth is slightly keeled; the fourth segment has a transverse dorsal depression, a setule on the back, the dorsal apex slightly projecting; the coalescent fifth and sixth segments are scarcely distinguished dorsally except by a slight transverse depression; the sixth segment carries a pair of dorsal setules, and the hinder angles on either side of the medio-dorsal line are slightly incurved; the lower hinder angles are as usual outdrawn; the postero-lateral angles of the first three pleon-segments are rounded.

Of the round simple *Eyes* one pair seem to project slightly beyond the margin of the head just below the lateral angles, while the other pair are a little above these angles, within the emarginate front border of the head.

Upper Antennæ rather longer than the lower. First joint rather short and thick, carrying several feathered cilia; the second joint much longer than the first, longer than the head, with slender spines, some very long, on the under margin and on the surface;

the third joint less than a fifth the length of the second, widening a little distally, with a long but very slender terminal spine or seta; the flagellum much longer than the peduncle, consisting of thirty-four slender joints, the lengths varying irregularly, some of the apical setiform spines being of very great length.

Lower Antennæ.—First and second joints short, the second apically pointed on the side opposite to the short blunt gland-cone; the third joint as long as the preceding two united, its upper margin convex, the lower nearly straight; the fourth joint slender, longer than the second of the upper antennæ, with long slender spines or setæ on the under margin; the fifth joint shorter than the fourth, similarly furnished, as long as the second joint of the upper antennæ; the flagellum of eighteen slender joints, together shorter than the peduncle, and shorter than the flagellum of the upper antennæ, apically furnished with slender spines of various lengths.

Upper Lip.—The outer plate with flattened sides, the distal margin semicircular, with a little almost central emargination, on either side of which it is furred, the cilia as usual directed from either side towards the centre; the inner plate less advanced, its distal outline similar but without any notch, the central part strongly furred.

Mandibles.—The principal and secondary plates on the left mandible with five or six teeth apiece, those on the right with the usual modifications; the spine-row on the left mandible having thirteen spines, close set, curving backwards, most strongly denticulate near the apex; on the right mandible there are only ten spines, and of these the innermost is linear; the crown of the molar tubercle on the left mandible is almost pentagonal, with small marginal teeth on two of the sides and some transverse ridges; on the right mandible it was only observed in profile; the first joint of the palp is short, narrow at the base, with a few small marginal spines; the other two joints are as in *Ampelisca chiltoni*.

Lower Lip.—The principal lobes broad, much ciliated, the inner lobes rather tumid; the mandibular processes little prominent.

First Maxillæ.—The inner plate narrow, with two short setæ on the apex; the outer plate broad, with the eleven spines on the broad distal margin like those of *Ampelisca chiltoni;* there are spines at four points of the outer margin of the joint supporting this plate; the first joint of the palp is short, with a spine at the middle of the outer margin; the second joint is long, curved, expanding distally, the five teeth of the apical margin small, and its five spine-teeth neither long nor broad; there are seven slender spines below the distal margin and seven fringing the convex outer margin.

Second Maxillæ like those of *Ampelisca chiltoni*.

Maxillipeds closely resembling those of *Ampelisca chiltoni;* on the outer plates, which reach as nearly as possible as far as the long second joint of the palp, there are eighteen to nineteen spines, ten or eleven belonging as spine-teeth to the inner margin, the rest to the distal, the outermost four being setiform; on the inner margin of the finger near the nail there are some half-dozen spinules.

First Gnathopods.—Side-plates much wider below than above, directed forwards so as to cover the basal joints of the lower antennæ, the strongly convex lower margin closely fringed with long setæ, the hind margin nearly straight, ending in a sharp, curved apical tooth, which does not reach so low as the lower margin. The first joint not reaching the end of the side-plate, widening distally, armed as usual; the second joint having much of the hind margin fringed with feathered setæ; the third joint oval, apically pointed, with many spines along the hind margin and across the distal half of the inner surface; the wrist with the front margin little convex, the free hind margin convex, crowded with spines, many of which are conspicuously pectinate to the tip; the inner surface has rows of long spines near the hind margin, and smaller groups near the front; the hand is rather narrowly oval, longer than half the wrist, with the palm not well marked, the spines on the hind margin pectinate at the centre; the inner surface having half a dozen spines along the centre and others near the front margin; the apical spines are long; the finger is rather short, the nail narrowing almost abruptly, not half the length of the upper part of the finger; the spinules of the inner margin are four or five in number, pectinate, the series beginning near the base of the nail.

Second Gnathopods.—Side-plates elongate, widening a little distally, the hind margin with a small apical tooth, the very convex lower margin strongly fringed. The branchial vesicles widening from a narrow neck, for the most part of even breadth to the end, longer than the first joint. The marsupial plates narrow, no setæ present. The first joint not nearly reaching the end of the side-plate, curved forwards, a few long setæ on the lower half of the convex hind margin; the second joint with a couple of setæ on the apex of the hind margin; the third joint rather broad, the hind margin nearly straight, smooth, the truncate distal margin having one feathered seta; the wrist narrow, with only a few spines at intervals on the margins and inner surface; the hand narrow, more than half the length of the wrist, with the hind margin free from spines for more than half its length, then carrying six or seven; there are eight or nine spines or setæ on the inner surface, and as many on the front margin and its apex; the finger is short, with five pectinate setules on the inner margin close to the base of the not elongated nail.

First Peræopods.—Side-plates rather wider below than above, the hind margin with a small apical tooth, the lower convex, well fringed. The branchial vesicles shorter than the side-plates, as long as the first joint, tending to oval, but with the front side flattened. The first joint not reaching the end of the side-plate, the front margin straight, the hind convex, with the usual armature; the second joint short; the third long, nearly parallel-sided, fringed with many long plumose setæ; much of the upper part of the front margin appears to be bare, but there are setæ on the inner surface, which might project beyond this margin; the fourth joint, which is longer than broad, has eight groups of long plumose setæ on the hind margin, and one or two spinules on the front apex; the fifth

joint has many plumose setæ on the lower two-thirds of the convex front margin, the hind being nearly straight, with a spine and seta at three points near the centre, the lowest seta being the longest; the finger is longer than the two preceding joints united, not much curved.

Second Peræopods.—The side-plates broad for almost the whole length, the angle below the hinder excavation upturned, acute, the margin below it only slightly oblique except at starting, forming a rounded corner with the long nearly straight lower margin. The first joint a good deal curved forwards, much of the convex hind margin strongly fringed with setæ, the front margin also carrying them on the lower part; the second joint has five plumose setæ along the hind margin; the third joint is as usual longer than in the first peræopods, and densely fringed on both margins; the short fourth joint has many setæ on the hind margin and a group on the front apex; the fifth joint is longer than in the preceding pair, but is similarly armed on both margins; the finger is long and but slightly curved.

Third Peræopods.—The side-plates broad, the front lobe deeper than the hind one. The branchial vesicles large, bent forward across the top of the first joint, but not reaching beyond the margin. The marsupial plates short and narrow, without setæ. The large first joint resembling that in *Ampelisca chiltoni*, the front margin except the upper part fringed with plumose setæ, and below a little overlapping the second joint; the lower part of the hind margin having a few spinules; the second joint with two or three spinules on the front apex; the third joint with slender pectinate spines along the convex margin and two at the hinder apex, also a strong bent spine at the front apex; the fourth joint with five strong spines and several slender ones on the front margin, three or four surface groups near the hind margin, and a large apical group fringing the lower margin, with five small spines and three large ones which are of very differing lengths but all three distally denticulate; the fifth joint, which is nearly as long as the fourth, but much narrower, has three spines on the slightly concave hind margin, the insertion marks of nine or ten on the convex front, and two spines on the produced apex; the small sharp finger has two dorsal denticles more prominent than usual, and two little curved setules at what may be the base of the nail.

Fourth Peræopods.—The side-plates deeper in front than behind, the front margin carrying some spinules and setæ, the lower margin behind little curved, fringed with setæ. The branchial vesicles as in the preceding segment, but narrower. The large first joint, as usual, bowed out in front, and there carrying seven plumose setæ, the rest of the margin having small spines and spinules, below somewhat overlapping the second joint; the rounded lower margin projecting much behind the second joint, the hind margin for much of its course straight, armed with small spines; the second joint with apical spinules in front; the third joint fringed with spinules in front, and having a spine at the apex, the apex behind carrying a short stout spine and two that are setiform; the

fourth joint, longer than the fifth or the two preceding united, has five strong spines on the front margin and a dozen smaller ones, besides some spinules; at the apex behind, on the slope of the lower margin, there is the usual group, including eight stout spines and three or four that are very slender; the serrate convex front margin of the fifth joint has eleven strong spines besides those on the produced apex; there are two on the hind margin; the upturned finger has two or three dorsal teeth.

Fifth Peræopods.—The shallow side-plates seem to be quite coalescent in front with the segment which on its lower border carries some spinules; the lower margin of the side-plate is convex, fringed with slender spines, and forming an angle with the straight upper margin. The front margin of the first joint is nearly straight, set with spinules, and having some small spines at the apex; the lower margin crosses the top of the second joint, then descends nearly to the end of the third, whence with a much-rounded angle it ascends again, forming a continuous curve with the hind margin, from which it is probably to be distinguished by the commencement of the fringe of plumose setæ and spines which ends at the lowest point of the joint; the width of this joint is much less than its length, it is greatest a little above the apex of the front margin; the second joint is very short, with some apical spines in front; the third is longer, especially behind, where the apex is far decurrent; the front margin has two or three setules and an apical spine; the hind margin is fringed with thirteen long plumose setæ and some spinules; the front margin of the fourth joint is rather shorter than the hind margin of the third; it has four groups of spinules, the lower two having each a spine also; the hinder apex has spines and a long seta; the fifth joint is laminar, longer than the fourth, with smooth margins, except at the apices which have the usual short spines; the finger is lanceolate, shorter than the preceding joint, marked like it within the hinder margin as if for the insertion of setæ, the nail or its equivalent abruptly tapering, having at its base a setule.

Uropods.—The peduncles of the first pair rather longer than the rami, the lower ramus rather longer than the upper, each with the apex acute, curved; the peduncles of the second pair rather longer than the rami, the upper ramus a very little longer than the lower, on which the denticulate spine near the apex is only moderately elongate; the marginal spines are numerous; the peduncles of the third pair shorter than the rami, the lower margin apically produced, the upper carrying a prominent spine; the rami very broadly lanceolate, equal in length, the inner margin of the inner ramus nearly smooth, the other margins, except at the upper part, carrying numerous long plumose setæ, the outer margin of the outer ramus showing also a series of spines, and a strip of its surface being coated with denticles.

The Telson a little longer than the peduncles of the third uropods, nearly twice as long as broad, cleft four-fifths of the length, the sides converging to two almost acute, not dehiscent, apices, each furnished with a spine and feathered cilium, the

surface carrying on each side half a dozen or more setæ, not quite symmetrically arranged.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the apex of the third uropods, rather over half an inch. Fully extended it would have measured a good deal more.

Locality.—Station 142, off Cape Agulhas, December 18, 1873; lat. 35° 4′ S., long. 18° 37′ E.; depth, 150 fathoms; bottom, green sand; bottom temperature, 47°. Three specimens.

Remarks.—The specific name refers to the colour of the specimens in spirits, which were dark, the branchial vesicles in particular being port-wine coloured.

Ampelisca zamboangæ, n. sp. (Pl. CVI.).

The Head as in *Ampelisca fusca;* the body more or less acutely compressed; the postero-lateral corners of the third pleon-segment almost right-angled, but with the points rounded; the fourth segment with a transverse dorsal depression, the carina at its apex raised above the succeeding segment; the fifth and sixth segments almost completely fused, the division marked by a transverse dorsal depression, the sixth segment with the usual dorsal and lower angles.

The Eyes small, the two pairs situated as in *Ampelisca fusca.*

Upper Antennæ.—First joint short and broad, with some feathered cilia on the upper margin, some groups of spines on the surface and at the apex, the lower surface adorned with seven or eight rows of long fine hairs; the second joint much narrower but not longer than the first, very much shorter than the head, furnished below with eight or nine groups of hairs like those of the first joint, but shorter; the third joint short, rather longer than broad; the flagellum of about twenty-four joints, together much longer than the peduncle, the first tapering, its upper margin straight, the lower oblique, armed with five groups of long and broad cylinders; on the third joint there is also a cylinder; the terminal joints are very long and slender.

Lower Antennæ much longer than the upper. The first two joints short; what appears to be the gland-cone of the second very inconspicuous; an acute apex on the opposite side; the third joint scarcely longer than broad, the serrate lower (or ? inner) margin closely set with nine or ten brushes of long hairs like those of the upper antennæ; the fourth joint nearly as long as the first and second of the upper antennæ united, with a few spines on the upper margin and thirteen tufts of hairs on the serrate lower margin; the fifth joint much longer, very slender, the spinules more thickly set on the lower than the upper margin; flagellum much longer than the peduncle, also much longer than the

flagellum of the upper antennæ, slender, with thirty-eight joints, of which the last is much shorter and narrower than the one preceding it.

Upper Lip not observed with sufficient distinctness for description.

Mandibles.—In the left mandible, which is drawn on the right hand of the Plate, the principal and secondary plates have each a border of four not very unequal teeth; on the right mandible the principal plate appears to have four or five teeth, the lowest being the longest, while the secondary plate is almost spine-like, having one prominent denticle on the side, while the denticles of the apical part are adpressed; the spine-row is of eight broad curved spines, which apically have a minutely furcate appearance, three spinules projecting between the longer front and shorter hind branch of the fork; the molar tubercle is prominent, with a lateral tooth on the forward side, and the crown bordered with comparatively few but broad denticles; the first joint of the massive palp is short but broad, widest distally; the second joint seems quite disproportionate to the trunk of the mandible, long, and of great breadth, its greatest breadth being nearer the base than the apex; it has slender spines at eight points on the front margin, and a few near the apex on the other; the third joint is of nearly the same length but much narrower, the outer margin convex, the inner carrying eight slender spines on its distal half, and two or three on the apex.

Lower Lip compact; the principal lobes broad and deep, ciliated on the inner margins and the inner part of the broadly convex distal margin; the inner lobes narrowly oval; the mandibular processes very little prominent.

The *First* and *Second Maxillæ*, so far as could be observed, are very like those of the preceding species; the inner plate of the first maxillæ apparently without setæ, the second joint of the palp having four spine-teeth on the dentate apical margin, besides slender subapical spines; the maxillipeds were not observed, having probably been lost during the dissection of the minute mouth-organs of this species.

First Gnathopods.—The side-plates directed forwards so as to cover the basal joints of the upper antennæ, much wider below than above, the hind margin produced into an apical tooth, between which and the very convex lower margin no interval is left; the fringe of the lower margin is not greatly developed. The first joint not reaching to the end of the side-plate, expanding a little distally, carrying six long setæ on the lower convex part of the front margin, three on the surface above the centre, five on the hind margin below it; the second joint not longer than broad, with five plumose setæ at the hinder apex; the third joint with a few spines on the hind margin and two large transverse groups on the inner surface at an angle with the oblique distal margin; the wrist rather broad, with many spines along the hind margin and on the inner surface near it, and a few spines near the front margin; the hand not very much shorter than the wrist, with spines at four points of the slightly convex front margin, besides the larger apical group; the hind margin is sinuous, bordered with spines of various lengths except for a

short space near the base; the palm-like concavity is near the hinge of the narrow curved finger, which is rather more than half the length of the hand, with a spinule near the centre of the inner margin and another at the base of the nail.

Second Gnathopods.—The side-plates very little widened distally, the apical tooth of the hind margin as in the preceding pair. The branchial vesicles longer than the side-plates, not quite so broad, with many transverse folds or pockets. The first joint not reaching the end of the side-plate, with long setæ on both margins, some of those on the lower part of the hind margin being extremely long; the second joint longer than broad; the third apically narrowed, with spines at one or two points of the lower part of the hind margin; the wrist long and narrow, with a few spines along the almost straight front margin, and eight rather large groups along the serrate hind margin; the hand narrow, half the length of the wrist, with six groups of spines along the hind margin, and about as many along the front; on the inner distal surface some rows of small spines; there is no pretence of a palm; the finger is very small, half the length of the hand, with a spinule on the inner margin a little way from the inward-bent nail and two others at its base; the dorsal cilium is close to the hinge.

First Peræopods.—The side-plates of almost even width throughout, the apical tooth of the hind margin as in the preceding pairs, the lower margin without any projecting fringe. The branchial vesicles longer than the side-plates, cylindrical, with transverse folds. The first joint not reaching the end of the side-plate, straight, expanding a little distally, furnished only with a few marginal spinules; the second joint short; the third nearly as long as the first, the hind margin fringed with fourteen long plumose setæ, the front having two spinules on the upper part, and on the lower two slender spines and five long plumose setæ; the fourth joint is much narrower than the third, scarcely longer than broad, with half a dozen setæ on the hind margin, and a seta and spinule on the front apex; the fifth joint is scarcely twice as long as the second, much wider at the base than distally, with slender spines or setæ along the slightly serrate lower part of the convex front margin, and three feathered setæ standing out from the lower half of the hind margin; the finger is slender, a little curved, very little longer than the two preceding joints united.

Second Peræopods.—The side-plates broad, with the front and hind margins almost parallel, the excavation behind shallow, but forming a produced angle, the lower margin slightly concave, its angles rounded, with some minute spinules near the edge. The branchial vesicles like the preceding pair. The first joint not reaching the end of the side-plate, distally dilated, with some long marginal setæ, chiefly on the lower part of the hind margin; the second joint with four plumose setæ along the hind margin; the third joint longer than in the preceding pair, both margins fringed with plumose setæ; the remaining joints nearly as in the preceding pair.

Third Peræopods.—Side-plates with the front lobe deeper than the hinder one.

Branchial vesicles bent forward across the top of the first joint. The first joint large, with some long setæ at the prominent part of the front margin, the lower margin behind projecting a little beyond the second joint; the third joint longer than the second, with a spine at the apex behind; the front margin the longer; the fourth joint longer than the two preceding united, or than the fifth, with five spines on the front margin and an apical seta, three or four surface spines near the smooth hind margin, and on the inner slope of its apex six stout spines, one of which is nearly as long as the succeeding joint, apically minutely denticulate; the fifth joint with six spines along the pectinate front margin, a long one on the produced apex, three short ones on the hind margin; the finger is minute, pointed, probably with a dorsal denticle.

Fourth Peræopods.—The side-plates deeper in front than behind. The branchial vesicles directed forwards across the top of the first joint, but not or scarcely reaching beyond it. The first joint large, of the usual shape, the prominent part of the front margin carrying small feathered setæ, the long hinder and lower margins having some scarce perceptible spinules; the second joint with an apical spine and spinules in front; the third joint with three spines on the front margin, one on the hinder apex; the fourth joint much longer than the fifth, with five large spines on the serrate front margin, besides eleven smaller ones, three surface spines near the smooth hind margin, and a large apical group of six; the fifth joint has nine spines on the serrate and pectinate front margin and apex, the apical spine being long; the smooth hind margin has two spines projecting from the adjacent surface; the tiny finger has a series of three rather long dorsal teeth, beyond which it becomes very narrow, here carrying two dorsal setules.

Fifth Peræopods.—The small side-plates have some spinules on the convex lower margin. The large first joint has the front margin nearly straight; the lower margin crosses the top of the second joint, and behind descends to its lower end, where it makes a small curve and then obliquely ascends to join the smooth convex hind margin, being itself not very closely fringed with plumose setæ and spinules; the breadth of the joint is rather more than half its length; the second joint is longer than the third or fourth, and as long as the fifth; near the front apex it has a group of six short spines; the much shorter and narrower third joint has one or two spines on the slightly decurrent front apex, a spine and long seta on the hinder one; the fourth joint, which is a little shorter than the fifth, is slightly widened distally, and has an apical group of short spines in front, and of spines and setæ behind; the fifth joint is laminar, the hind margin a little more convex than the front, both smooth, the distal margin truncate, with some apical spinules at either side; the finger lanceolate, rather longer than the fifth joint, ending in an abruptly tapering limp sort of nail, with a minute setule at its base; near the hind margin of both fifth joint and finger there is a row of marks, as if the insertion-places of setules.

Pleopods.—The peduncles carrying plumose setæ; the coupling spines not examined;

the cleft spines four in number on the second and third pairs; the joints of the rami numbering from sixteen to eighteen.

Uropods.—The peduncles of the first pair subequal in length to the rami; the rami almost equal, with few marginal spines, the upper edges pectinate; the peduncles of the second pair scarcely reaching beyond those of the first pair, longer than the outer ramus, subequal in length to the inner; both rami have strongly pectinate edges, the upper and longer ramus having also five spines on one margin and one at the top of the other, the lower ramus having three spines on one margin and two near the top of the other; the peduncles of the third pair shorter than the rami, having two spines on the upper inner margin; the rami broad, lanceolate, the outer the narrower, not longer than the inner, but produced beyond it, with six or seven small spines along the outer margin, the inner margin serrate, pectinate, carrying nine or ten plumose setæ; the inner rami coming together like the plates of a cleft telson, the inner margin smooth, the outer serrate, furnished with spines and plumose setæ, few of which, however, were remaining in our specimen.

The Telson not twice as long as broad, widest at a little distance from the base, the convex sides then rapidly converging to the two acute apices, being notched for a spine a little before the apex is reached; cleft between four-fifths and three-quarters of the length, not dehiscent; the surface has a couple of spines not symmetrically placed, one on either side of the cleft.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the apex of the third uropods, just over a fifth of an inch.

Locality.—The single specimen was labelled as having been taken at the surface on February 18, 1875, off Samboangan, Philippine Islands.

Remarks.—The specific name refers to the place of capture.

From the other species here described the present is rather remarkably distinguished by the long fifth joint of the upper antennæ, and the great palp of the mandibles, but these differences do not seem to require the institution of a new genus.

Family Photidæ.

In 1870 Boeck made the Photinæ the eighteenth subfamily of the Gammaridæ; by a misreckoning in the Crust. amph. bor. et arct., p. 151, he calls it "Subfamilia XVII.," and from the account which he gives of his earlier work in his later, De Skand. og Arkt. Amphipoder, p. 72, he omits the Photinæ altogether, perhaps owing to the previous miscalculation. In the later work itself he makes the Photinæ the second subfamily of a new family, the Photidæ, in which he also places the Leptocheirinæ and

the Microdeutopinæ. To the Leptocheirinæ he assigns the genera *Leptocheirus* and *Goësia;* to the Photinæ *Photis*, *Microprotopus*, and *Xenoclea;* to the Microdeutopinæ *Microdeutopus*, *Aora*, *Autonoë*, *Protomedeia*, *Gammaropsis*, *Podoceropsis*, and *Megamphopus*. In 1882 Sars made of the Microdeutopinæ the family Microdeutopidæ, including in it the genera just named, except that he does not specify *Megamphopus;* at the same time he united the Leptocheirinæ and Photinæ to form the family Photidæ, placing in it the genera *Ptilocheirus* [*Leptocheirus*], *Photis*, *Microprotopus*, and *Xenoclea*, presumably only omitting *Goësia* as not belonging to the fauna with which he was then concerned. By Gerstaecker, in 1886, all these genera except *Photis*[1] are placed in "Tribus I. *Corophiina* (*Marcheurs*, M.-Edw.)," "Fam. 3. *Corophiidæ* Dana," "2. Gruppe," while *Photis* is placed in "Tribus II. *Gammarina genuina* (*Sauteurs*, M.-Edw.)," "Fam. 6. *Gammaridæ*," "Subfam. 5. *Gammarina*."

Boeck defined the family Photidæ as follows :—

"*Upper Lip* broad, apically rounded.

"*Mandibles* strong, apically dentate; the secondary plate also dentate; the molar tubercle prominent; the palp three-jointed.

"*First Maxillæ* with the inner plate generally small or of moderate size.

"*Second Maxillæ* with the plates broad.

"*Maxillipeds* generally furnished on the inner margin [of the outer plates] with teeth, few, but strong, as they approach the apex longer and curved, sometimes furnished with slender spines; the last joint of the palp rarely not unguiform.

"The body more or less compressed, with the back rounded.

"*Upper Antennæ* with the accessory flagellum small or absent.

"*First Gnathopods* with a subcheliform hand.

"*Second Gnathopods* with the hand subcheliform, seldom scarcely subcheliform.

"The *Fourth Peræopods* as a rule much longer than the *Third*, and the *Fifth* than the *Fourth*.

"The *Third Uropods* biramous, rarely uniramous.

"*Telson* thick."

The distinctions which Boeck seeks to establish between the three groups which he calls subfamilies of this family are not very easy to appreciate. Indeed in my opinion *Xenoclea*, Boeck, the third genus of the Photinæ, is identical with *Podoceropsis*, Boeck, the sixth genus of the Microdeutopinæ. In *Photis* the inner ramus of the third uropods is minute, and in *Microprotopus* these uropods have but one ramus, so that there might be some reason for placing these two genera in a separate group, but if the Leptocheirinæ and Photinæ are combined, it seems impossible to formulate a definition that will separate them from the Microdeutopinæ. Boeck's Leptocheirinæ

[1] He does not name Norman's *Megamphopus*, which is only incidentally mentioned by Boeck, and has probably often escaped notice from the fact that the description has only been published in the British Association Reports.

have thin spines, not teeth, on the outer plates of the maxillipeds, and the side-plates of moderate size or large, while his Microdeutopinæ have teeth on the outer plates of the maxillipeds and the side-plates small, but Boeck's Photinæ agree with his Microdeutopinæ in the armature of the maxilliped-plates, and in point of fact some of the Microdeutopinæ have the side-plates well developed. In describing the family Photidæ, and also the subfamily Microdeutopinæ, Boeck says that the accessory flagellum of the upper antennæ is small or absent, whereas in reality among his Microdeutopinæ it is sometimes of considerable size; if therefore the term Photidæ be accepted as a sufficient heading for all the three groups, it will be necessary to modify the character by saying that this accessory flagellum is of variable size or absent. It will also, I think, be proper to state that the fifth pair of side-plates are nearly as deep as the fourth pair.

Genus *Photis*, Krøyer, 1842.

1842. *Photis*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. Hfte 2, p. 155.
1845. „ Krøyer, Naturh. Tidsskr., R. 2, Bd. i. p. 341.
1849. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. No. 22.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 911.
1862. *Eiscladus*, Bate and Westwood, Brit. Sess. Crust., vol. i. p. 411.
1865. *Amphithoe*, Goës, Crust. amph. maris Spetsb., p. 16.
1869. *Heiscladus*, Norman, Last Report on Dredging among the Shetland Isles, p. 284.
1870. *Photis*, Boeck, Crust. amph. bor. et arct., p. 152.
1874. *Heiscladius*, M'Intosh, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv. No. 82.
1876. *Photis*, Boeck, De Skand. og Arkt. Amph., p. 553.
1877. „ Meinert, Crust. Isop. Amphip. et Decap. Daniæ, p. 141.
1882. „ Sars, Oversigt af Norges Crustaceer, pp. 30, 110.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 506.
1887. „ Chevreux, Catal. Amph. marins Bretagne, p. 24.

For the original definition of the genus, see Note on Krøyer, 1842 (p. 199); for Bate and Westwood's definition of *Eiscladus*, see Note on Bate and Westwood, 1862 (p. 340). In 1876 Boeck gives the following definition :—

"*Upper Antennæ* with the third joint of the peduncle elongate; accessory flagellum absent.

"*First Gnathopods* with a short wrist.

"*First* and *Second Peræopods* with the first joint not thick.

"*Third Uropods* with the inner ramus minute.

"*Telson* apically rounded."

The new species, *Photis macrocarpus*, requires the cancelling of the second of these characters. Some of those characters which Boeck places in the definition of the subfamily Photinæ ought perhaps to be added to the generic account, if the subfamily itself is dropped. Of the mandibles he says that the spine-row consists of few (four)

spines, and that the third joint of the elongate palp is shorter than the second; of the maxillipeds, that the plates are strong, the inner armed with three teeth, the outer armed on the inner margin with teeth few but strong, as they approach the apex longer and narrower, the series ending with curved setæ, and that the last joint of the elongate palp is not unguiform but apically armed with strong spines; of the side-plates that the four anterior pairs are large, feathered on the lower margin, and that the fifth pair are larger than the fourth, incised on the hinder margin for the retroverted third peræopods. It is obviously only by a misprint or slip of the pen that he speaks of the fifth peræopods being *shorter*, instead of longer, than the fourth.

Photis macrocarpus, n. sp. (Pl. CVII.).

Rostrum quite small, lateral lobes of the head small and angular; the postero-lateral corners of the second and third pleon-segments almost squared, with two little spinules within the hind margin.

Eyes small, round, situated on the lateral lobes of the head, the ocelli very few.

Upper Antennæ.—First joint rather long and stout, with one or two slender spines at the lower apex, the second joint longer and more slender, with slender spines at six points of the lower margin; the third joint about as long as the first, with five pairs of spines on the lower margin, the lowest the longest; the flagellum of fourteen slender joints, together about as long as the peduncle, and carrying similar spines.

Lower Antennæ subequal in length to the upper The first two joints short, the gland-cone small, not very prominent; the third joint as long as the preceding two united; the fourth subequal to the second of the upper antennæ, proximally bent and thin, a little widened distally, with a few slender spines on the under margin; the fifth joint shorter than the preceding, longer than the third of the upper antennæ, slightly curved, with spines at five points of the lower margin; the flagellum of twelve slender joints tipped with longer or shorter spines. Many of the spines on both pairs of antennæ are slightly flattened on the concave border.

Upper Lip.—The front plate broad, its distal margin convex, unsymmetrically emarginate, furred with small cilia pointing inwards on either side of the shallow emargination.

Mandibles.—The trunk very small compared with the palp; the cutting plate having its edge divided into five teeth; the secondary plate on the left mandible has four teeth; on the right mandible the secondary plate is smaller, ending in one prominent tooth, along the side of which are several denticles; there are on the left mandible four, on the right mandible three, much bent denticulate spines in the spine-row, followed by some plumose cilia; the molar tubercle is tolerably strong, with the crown nearly round and closely set with fine denticles; at its outer corner a small

thin plate projects, with a finely denticulate edge (this minute feature I left unfigured, supposing it due to an accidental laceration, but it is found also in *Autonoe, Gammaropsis, Podocerus, Cerapus, Platophium*); there is a process above the molar tubercle near the base of the palp; the first joint of the palp is short, widening distally, rather longer than broad; the second joint is large, armed on the inner margin or adjacent surface with about a dozen spines of different lengths; the third joint is nearly as long, widening distally to considerably more than the width of the second joint, the lower part of the inner margin nearly straight, unarmed, the remainder as far as the apex curved, set closely with numerous long spines, some slightly plumose, most of them strongly pectinate; the outer margin is very slightly convex; adjacent to it on the inner surface some way below the apex is a row of four long spines, while on the outer surface, besides a continuation of this group, there are spines at five other points lower down and away from the margin, the set consisting of two pairs and three single spines.

Lower Lip.—The principal lobes ciliated round the distal and inner margins; the inner plates thick, distally rounded and broad, narrowing to the base; the mandibular processes small, rather divergent.

First Maxillæ.—The inner plate broad at the base (but a view of this breadth not easily obtained), with a setule on the narrowly rounded apex; the outer plate carrying on the distal edge ten slightly denticulate spines; the first joint of the palp very short, the second long, curving over the outer plate, its distal margin carrying four strong, variously cut spine-teeth, and a slender spine-tooth in the inner corner; there are besides three submarginal spines, slender, pectinate on two edges.

Second Maxillæ.—The inner plate shorter and narrower than the outer, with thirteen setæ passing across from the base of the inner margin in a curve towards the outer apex, the upper part of the inner margin fringed with spines, the apical margin flattened and unarmed; the outer plates broadest at the rounded apical margin, which is fringed with many spines.

Maxillipeds.—The inner plates short and broad, not quite reaching the distal end of the palp's first joint, fringed with setæ along the distal part of the inner margin, on the outer surface of which there is a spine-tooth just below the apex; the broad straight distal margin has three irregular spine-teeth, and many slender feathered spines; the outer plates do not reach the distal end of the palp's second joint, the inner margin has seven spine-teeth, the series being continued round the distal margin by six longer teeth or spines; there is as usual a row of slender spines on the outer surface within the inner margin; the first joint of the palp is short, the second long, with many long spines on the inner margin and outer surface; the third joint is as long as the first, distally widened, set about the apex and surface with long spines, of which one at the apex is conspicuously pectinate; the finger is longer than the third joint, if a long pectinate spine which appears to do duty for a nail be included; this spine is as

long as the basal part of the finger, on the inner margin of which close by is another spine of almost equal length, and needle-like.

The *triturating organs* of the stomach show on one side about fifteen strong spines, wearing something the appearance of a set of Pandean pipes, but a little bent; on the other side are numerous slender spines.

First Gnathopods.—The side-plates wider below than above, the lower front corner being produced over the basal joints of the lower antennæ. First joint reaching beyond the side-plate, a little curved, the front concave margin having some spinules, the convex hind margin seven long setæ on the central part, besides some slender spines; four long setæ high up on the surface project beyond the front margin; the second joint is short, with several long spines at the apex behind; the third joint has convex sides converging to an acute apex, with long spines on the lower part of the hind margin and on the inner surface across the apex; the wrist is rather longer than the hand, fringed along the hind margin and at the front apex with many long spines, of which there are some also on the surfaces, chiefly on the inner; the hand oval, narrowing towards the hinge of the finger, the palm minutely pectinate, occupying more than half the hind margin, set with various spines; the two surfaces of the hand also are armed with many groups of spines; the finger is more than half the length of the hand, rather broad, curved, chiefly at the nail, which reaches just beyond the palm; the inner margin of the finger cut into seven decurrent teeth, and carrying a few small setules; the dorsal cilium rather long, placed very near the hinge.

Second Gnathopods.—Side-plates oblong, with rounded corners. Branchial vesicles narrow, not quite so long as the side-plates. The marsupial plates longer than the branchial vesicles, widening a little from the basal part, and fringed with sixteen setæ. The first joint reaching beyond the side-plates, the front margin straight, with a seta near the apex, the hind margin somewhat sinuous, armed with a few setiform spines; the second joint short, with one or two apical spinules; the third rather longer and more acute than in the first gnathopods, but similarly armed; the wrist shorter than the hand, distally broad, cup-like, with a few spines at the front apex, and many on the rounded corner behind as well as on the lower margin of the inner surface; the hand large and broad, the front margin gently convex; the hind margin, which is slightly serrate and set with spines, is almost straight and longer than the oblique palm, over which the finger closes as in the first pair; there are several surface groups of spines; the finger is dentate on the inner edge. In the male the first joint is much more dilated, and the hind margin of the hand is produced into a tooth carrying a palmar spine at the commencement of the palm, which is excavated.

First Peræopods.—Side-plates and branchial vesicles similar to the preceding pair. The first joint considerably longer than the branchial vesicle, straight, gradually dilated distally, with some long setæ at parts of both margins, those on the hind margin near the

middle five in number. The second joint is short, with an apical spinule, the third is long and broad, the hind margin smooth and nearly straight, the front convex, fringed with groups of long slender spines, the largest group being on the rounded apex; the fourth joint is of a similar shape, but much narrower, and only half the length; it has a few spines at each apex; the fifth joint is longer and much narrower than the fourth, slightly curved, tapering distally, with some spines at the middle and apex of the front margin, and a spinule at each of three points on the hind margin; the finger is narrow, curved, more than half the length of the fifth joint, with a small dorsal cilium near the hinge.

Second Peræopods.—Side-plates like the preceding pair, perhaps a little broader, as those are than the pair preceding; not excavate behind. The limb nearly the same as in the first peræopods.

Third Peræopods.—The side-plates broad, the front lobe less deep than the preceding pair, but of the same pattern, the hind lobe small. The branchial vesicles small, a narrow oval in shape. The marsupial plates narrower than the branchial vesicles, about as long, with six or seven setæ. The first joint of the limb much broader above than below, the upper part of each margin convex, the lower nearly straight, with few spines or setæ; the second joint short, its front margin like that of the three following joints convex, apically tipped with a setule; the third joint rather longer than the fourth and slightly broader, the hind margin straight, the fourth joint with a group of long spines at the apex of the straight hind margin; the fifth joint as long as the third, narrower than the fourth, the hind margin a little concave, the apex carrying a short spine and one or two long ones; the finger minute, sharply upturned, with a dorsal denticle. The last two joints, and perhaps the last four, in this pair of legs may be regarded as retroverted, facing, that is to say, in a direction opposite to that of the first two joints.

Fourth Peræopods.—Side-plates small. The limb similar to the preceding pair, but all the joints more elongate, particularly the third, fourth, and fifth; the first joint is a little more regularly narrowed towards the distal end, with the margins gently convex; the minute and upward-curved finger has a small tooth on the inner margin at the base of the nail, the dorsal denticle is very distinct, and there is a small dorsal cilium near the hinge.

Fifth Peræopods.—Side-plates small. The limb much more elongate than that of the preceding pair; the first joint not much dilated or especially at any one part, the front margin for the most part straight and smooth, the hind margin jutting out a little at the upper corner, the rest convex, carrying a few spinules; the third joint straight, longer than the fourth, but a good deal shorter than the fifth; the long fifth joint has two small groups of spines on each margin towards the distal end; the finger is slender, little curved, less than half the length of the fifth joint, ending in a minute nail.

Pleopods.—The coupling spines very small, curved, with a pair of lateral teeth similar to the flukes of the apex just beyond them; on some of the peduncles there were long

spines or setæ; I could not discover cleft spines on any of the pairs; the joints of the rami numbered from eight or ten.

Uropods.—Peduncles of the first pair[1] not reaching so far as those of the second, longer than the rami, one margin free from spines except at the apex; the outer ramus shorter and narrower than the inner, with several marginal spines and a nail-like one on the blunt apex; the inner ramus with five or six spines along one margin, and a large apical spine; the peduncles of the second pair only a little longer than the inner ramus, which is stouter and longer than the outer ramus, and has six spines on one of its margins; each of the rami has a strong apical spine; the peduncles of the third pair[1] about as long as the outer ramus, which is slender, curved, and has at the end a short second joint, tipped with a long straight spine; the inner ramus is minute, tipped with a spine.

The Telson is small, about as broad as long, not nearly reaching the end of the peduncles of the third uropods, the convex sides converging to a slightly rounded apex, near which there are one or two cilia on the surface close to the margin on either side.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the apex of the third uropods, three-tenths of an inch.

Locality.—The specimens were taken at Kerguelen, depth not mentioned. Several specimens were obtained, most of them apparently, like the one figured, being females, but one at least by the difference in the gnathopods appeared to be a male.

Remarks.—The specific name refers to the length of the wrist in the first gnathopods, to which it seemed the more necessary to call attention, since Boeck has included in the generic character of *Photis*, the statement "pedes 1mi paris carpo brevi."

Photis brevicaudata, n. sp. (Pl. CVIII.).

Rostrum small, lateral lobes of the head sharply angled; the postero-lateral corners of the first three pleon-segments squared, the points rounded.

Eyes small, round, situated on the angular lateral lobes, with many rather broad ocelli, the median line of each being in this, as in the preceding species, very distinct; the colour is dark in the specimen preserved in spirit.

Upper Antennæ.—The first joint rather thick, not twice as long as broad, tapering a little distally, carrying two spines and some cilia on the lower apex; the second joint considerably longer, much thinner, with slender spines at five points of the lower margin, the apical the longest; the third joint intermediate in length between the first and second, with spines at six points of the lower margin, the apical very long; the flagellum of seven or eight joints, moderately slender, together shorter than the peduncle, the lower apex carrying long spines, which like many of those on the peduncle are pretty

[1] On the Plate the numbers *ur.*3. and *ur.*1. should be interchanged.

strongly feathered on the concave margin; the last joint has a pair rather stronger and shorter than those on the other joints, besides several slighter appendages.

Lower Antennæ.—The first two joints very short, the gland-cone not prominent; the third joint as long as the two preceding united, or a little longer, with several slender spines at the lower apex; the fourth joint as long as the second of the upper antennæ, curved at the base, bordered with spines below; the fifth joint as long as the fourth, similarly fringed with spines, feathered on the concave margin, and attaining their greatest length at the apex of the joint; the flagellum of six joints is shorter than the peduncle, and rather shorter than the flagellum of the upper antennæ; the apical spines of the last two joints are stouter than the others, but feathered in the same manner.

Mandibles scarcely differing from those of *Photis macrocarpus*, except that the third joint of the palp is very little widened distally, and has not so many spines on the apical margin.

Lower Lip as in *Photis macrocarpus*.

First Maxillæ.—Inner plate small, oval; outer plate broad, the broad distal margin carrying ten spines, with but few lateral denticles, three of them having a single denticle on the outer convex side, two having two denticles on the inner concave side; the five spine-teeth on the distal margin of the palp's second joint much resemble those in the other species, the outermost rather narrow, the innermost very narrow, the three between broad, furcate, with the outer edge dentate.

Second Maxillæ like those in *Photis macrocarpus*, but without the flattened distal edge of the inner plate.

Maxillipeds similar to those of the species just mentioned; the distal margin of the inner plates slopes a little inwards, and has the spine-teeth regular in shape, the slender spines fewer in number; the outer plates have five spine-teeth on the inner margin and four on the inward-sloping distal margin; the third joint of the palp is longer than the first.

First Gnathopods.—Side-plates rather deep, not expanded below. The first joint with some long setæ at various points of the convex hind margin, and others on the surface projecting on the front margin; the second joint short, with a large group of long, more or less feathered, setæ near the hinder apex; the third joint very little longer than the second, with numerous long spines crossing the inner surface a little above the apex; the wrist broad, in length nearly equal to the hand, with a group of spines on the front apex, many more or less pectinate on the hind margin, and groups near it on the inner surface; the hand is oval, broad at the base, narrowing towards the hinge of the finger, the front margin smooth, but with two large groups of spines on the inner surface near it and an apical group, the hind margin occupied chiefly by the finely pectinate palm, which is bordered by various spines singly and in groups; there are at intervals two or three strong palmar spines, and on both surfaces there are spines remote from the margin; the

finger is broad, the inner margin pectinate and cut into four strong decurrent teeth; the dorsal cilium near the base is rather long; there are also some setules at the base of the nail, which is curved and scarcely reaches the extremity of what may be considered as the palm-border.

Second Gnathopods.—The side-plates deep, wider below than above, the hind margin slightly concave. The branchial vesicles much shorter and narrower than the side-plates. The marsupial plates rather longer than the branchial vesicles, narrow at the basal part, carrying fifteen setæ on the lateral margins and apex. The first joint not reaching beyond the side-plate, the convex hind margin having some long setæ at the apex; the short second joint with an apical group of setæ, one long and plumose; the third joint rather longer than in the first gnathopods, similarly armed; the wrist much shorter than the hand, broader than long, distally cup-like, with long spines at the front apex and on the narrow hind margin, and some on the lower margin of the inner surface; the hand broad, between oval and oblong, with a single seta-like spine above the middle of the front margin, a group between that and the apex and another at the apex, these spines being slightly plumose; the hind margin bordered with more or less pectinate spines, and produced into a tooth at the commencement of the palm, within which the finger closes down against a strong palmar spine; the palm is obliquely excavate for some distance, bordered with several spines, of which there are also various groups on both surfaces of the hand; the finger is broad, with five decurrent teeth on the inner margin.

First Peræopods.—Side-plates rather deeper than the preceding pair, a very little wider below than above, with the front margin convex and the hinder concave. The branchial vesicles narrow, widening a little distally. The marsupial plates as in the preceding segment. The first joint not reaching the end of the side-plate, with four long setæ on the lower part of the hind margin, the lowest conspicuously plumose; near the apex is a shorter plumose seta; the second joint short, with a long plumose seta at the hinder apex; the third joint stout, longer than the fourth, its convex margin fringed with about fourteen long plumose setæ, the hind margin almost straight, with some setules at the apex; the fourth joint with a group of setæ at the apex of the convex front margin, and some very slender setæ or setules at the apex of the straight hind margin; the fifth joint as long as the third, tapering distally, the convex hind margin with six or seven groups of long slender setæ, the straight front margin with a spinule at the apex and another higher up; the finger curved, rather more than half the length of the fifth joint.

Second Peræopods.—These in all respects closely resemble the preceding pair; the side-plates a little broader, and an extra setule perhaps on the hind margin of the fifth joint of the limb.

Third Peræopods.—Side-plates scarcely less deep and much broader than the preceding, the front and hind margins both convex, the hind lobe very small. Branchial

vesicles small, oval. Marsupial plates short and narrow, longer and narrower than the branchial vesicles, with half a dozen setæ. The first joint of the limb much smaller than the side-plate, much dilated, broader below than above, fully as broad as long, with the margins almost unarmed; the second joint short, not longer than broad; the third a little longer than the second, and the fourth than the third, all three with the front margin convex, and some apical spinules, the fourth with a long straight spine on the hinder apex; the fifth joint much narrower than the fourth, almost as long, the front margin convex, with an apical spine and spinules, the hind margin tending to concave, with a setule at the centre, a strong spine at the apex, accompanied as in the preceding species by a much shorter one; against these the minute finger bends upwards and backwards, it is very thick at the base, with a small dorsal cilium, and a strong dorsal denticle, the apical part beyond the denticle being comparatively narrow.

Fourth Peræopods longer than the third. Side-plates small. Branchial vesicles narrow, shorter than the first joint. The first joint as long as in the third peræopods, but not so broad, wider above than below, the margins carrying a few setules; the rest of the limb like that of the preceding pair, except that the joints are more elongated, and the fifth decidedly shorter than the fourth; the finger is produced to a very sharp apex.

Fifth Peræopods very little longer than the fourth. The first joint a little longer, but narrower than in the preceding pair, most narrowed at the junction with the second joint; the second joint longer than broad; the third longer than the second, the fourth scarcely longer than the third, each of these two with a spine on the hinder apex; the fifth longer than the fourth, with a group of slender setæ on the apex of the convex hind margin, two small setules and a small apical spine on the straight front margin; the finger curved, half the length of the fifth joint, with a strong dorsal cilium close to the hinge, and a small dorsal denticle over the base of the nail.

Pleopods.—The coupling spines very small and slender, curved, with apparently two lateral retroverted hooks below the apex; the peduncles have also many long setæ. I have not been able to discover any cleft spines; the joints of the rami number from seven or eight to nine.

Uropods.—The peduncles of the first pair are much longer than the rami; the outer ramus is rather shorter than the inner and has a series of five spines beginning above the middle of the outer margin, and a stronger spine at the blunt apex; the inner ramus has a like apex and two or more distant spines on the inner margin; the peduncles of the second pair are slightly longer than the inner ramus, which has four spines along the inner margin and a strong apical spine flanked by two small ones; the outer ramus is considerably shorter, with a similar apex, and two spines on the side. The peduncles of the third pair are a little longer than the outer ramus, which does not reach back so far as the rami of the other two pairs; it is slightly curved, tapering distally to the short second joint, which is tipped with a long spine; the inner ramus is

very short, yet twice as long as broad, its edges pectinate, as seems to be the case with all the rami, the apex narrowed to two sharp points, between which is a little spine.

The Telson is very short, broader than long, the sides converging to a broadly rounded apex.

Length.—The specimen, in the position figured, measured, from the rostrum to the apex of the second uropods, three-twentieths of an inch.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. One specimen, female.

Remark.—The specific name refers to the shortness of the telson.

Genus *Aora*, Krøyer, 1845.

1845. *Aora*, Krøyer, Naturh. Tidsskr., R. 2, Bd. i. p. 335.
1849. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. No. 22.
1849. *Lalaria*, Nicolet, Gay's Hist. fis. y pol. de Chile, Zool., t. 3.
1852. *Aora*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 913.
1857. *Lonchomerus*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 11 (sep. copy).
1857. „ White, Popular History of British Crustacea, p. 180.
1857. *Lalaria*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 2, vol. xx. p. 525.
1859. *Autonoë* (*pars*), Bruzelius, Skand. Amph. Gamm., p. 23.
1862. *Aora*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 160.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 279.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 281.
1870. „ Boeck, Crust. amph. bor. et arct., p. 157.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 569.
1878. „ Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 52.
1879. „ G. M. Thomson, Ann. and Mag. Nat. Hist., ser. 5, vol. iv. No. 23.
1880. *Microdeuteropus* (*pars*), Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 339.
1881. *Aora*, G. M. Thomson, Trans. New Zealand Inst., vol. xiii. p. 216.
1882. „ Chilton, Trans. New Zealand Inst., vol. xiv. p. 178.
1884. „ Chilton, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. p. 6 (extract).
1885. „ Chilton, Ann. and Mag. Nat. Hist., ser. 5, vol. xvi. p. 369.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.
1886. „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 147.
1887. „ Chevreux, Catal. Crust. Amph. marins Bretagne, pp. 26, 33.

For the original definition of the genus, see Note on Krøyer, 1845 (p. 211); for that of *Lalaria*, see Note on Nicolet, 1849 (p. 231); for that of *Lonchomerus*, see Note on Spence Bate, 1857 (p. 294), and for that of *Autonoë*, see Note on Bruzelius, 1859 (p. 312). Boeck in 1876 gives the following definition :—

"*First Gnathopods* larger than the *Second*; in the male the third joint produced behind into a long stiliform process; the wrist elongate, narrow; the hand also elongate, oval; in the female the third joint not produced at the lower hinder angle; the wrist short; the hand broad.

"As to other points almost as in the genus *Microdeutopus*."

In describing the subfamily Microdeutopinæ, Boeck says that the third joint of the elongate mandibular palp is apically obtuse, rounded; that the first maxillæ have the inner plate small, and the second maxillæ the plates very broad, that the maxillipeds have the outer plates armed with teeth, and the last joint of the palp apically armed with two strong curved spines; that the flagellum of the lower antennæ is not very long, that the uropods are biramous and the telson thick. In the definition of *Microdeutopus*, Costa, he says (see p. 1082) that the upper antennæ have the third joint of the peduncle short, and that the third uropods have rami of almost equal length. Mr. Chilton is of opinion that *Microdeutopus* ought to become a synonym of *Aora*, the females being practically undistinguishable. M. Chevreux, on the other hand, hopes to be able to publish characters by which the very similar females of *Aora*, *Microdeutopus*, and *Stimpsonia* may be discriminated.

Aora kergueleni, n. sp. (Pl. CIX. figs. A. ♂, D. ♀).

Rostrum minute, lateral lobes of the head broadly convex, little prominent, lower angles of the head acute; postero-lateral angles of the first three pleon-segments rounded.

Eyes small, tending to oval, situated on, but by no means filling, the lateral lobes of the head.

Upper Antennæ.—First joint long and thick. The other joints missing in the specimen figured, but in a second specimen resembling those of *Aora trichobostrychus*, the flagellum with thirty-three joints.

Lower Antennæ.—The first two joints short, the gland-cone decurrent; the third joint longer than the preceding two united, with some small stout spines at the apex; these three joints united not as long as the first of the upper antennæ. The other joints missing in the specimen figured; in another specimen the fourth and fifth joints were equal in length; the flagellum of eleven joints, was scarcely so long as the fifth joint of the peduncle.

Upper Lip.—The distal margin describes a broad curve, much projecting at the central part, the middle of which is smooth, except that straight spine-like cilia project a little from the inner surface, while a brush of cilia is directed towards it from the margin on either side.

Mandibles.—The cutting edge has six teeth; the secondary plate of the left mandible probably has five; that of the right mandible, fig. *m*. A., is very narrow, showing only two distinct teeth, but it probably has two or three denticles as well; the spine-row consists of four broad overlapping spines, the oblique distal margin of which is cut into denticles; the spines are followed by two or three plumose setæ; the molar tubercle is prominent, the crown surrounded with long teeth, and its

surface covered with small denticles; it has a plumose seta at one corner; the first joint of the palp is twice as long as broad; the second about twice as long as the first, with three spines on and two near the front margin; the third joint shorter than the second, with more than half of each margin clear of spines, of which there are two planted close to the convex hind margin a little above the centre, while on the straight front margin there is a row of half a dozen long and strongly pectinate spines passing up to the narrow apex, and parallel with these are two rows of short pectinate spines.

Lower Lip.—Both the principal lobes were widely dehiscent, causing the mandibular processes to appear nearly parallel; it is however obvious that if the lobes came nearer together, the mandibular processes would become proportionately divergent; the principal lobes have their distal margins fringed with spines, set close together and very numerous, as many as thirty, the inner margins are as usual ciliated, as are those of the inner lobes, which apically are narrow; the mandibular processes are long and acute, the outer margins convex, the inner tending to concave.

First Maxillæ.—The inner plate very small, closely pressed against the outer plate, carrying a single very long thin plumose seta on the apex; the ten spines on the apical margin of the outer plate seem in no case to have more than three lateral denticles; of the three outermost one showed no denticle, of the next pair one was apically furcate, of the remainder two had a single denticle apiece on the outer side; the first joint of the palp is rather longer than broad, the second, expanding from the base, curves beyond the outer plate, with a spine below the middle of the very convex outer margin, seven or eight serrate spine-teeth on the apical border, and several slender spines, perhaps a dozen, beginning near the middle of the concave inner margin, and passing across to the outer apex.

Second Maxillæ.—The inner plate shorter and much narrower than the outer, with a series of about twenty-four plumose setæ, beginning low down on the inner margin, and passing in a curve on the surface across towards the outer apex; there are spines at intervals round much of the inner margin, and densely set on the rounded, rather narrow, apical margin; the outer plate, of almost uniform breadth, has the outer margin convex, the inner tending to concave, the distal almost truncate, with an outward slope; on the inner corner are many spines, and some long ones in a series, commencing on the inner margin and passing across the inner apex; the rest of the distal margin is occupied by six or seven smaller spines not closely set.

Maxillipeds.—The inner plates, reaching as far as the apex of the first joint of the palp, having many plumose setæ on the inner margin, and a spine-tooth near its apex; the irregular apical margin, which slopes abruptly at the outer corners, carries four spine-teeth and many slender plumose spines; the outer plates reaching the apex of the second joint of the palp, with eleven spine-teeth on the serrate inner margin, and eight spines

round the distal margin, of which three are spine-teeth, the rest slender or setiform; the first joint of the palp short, the second not greatly elongate, twice as long as the first; the third joint not much longer than the first, distally expanded, produced in a little apical cap over the base of the finger, and carrying many spines about the distal half; the finger little shorter than the third joint, not stout, with some setules on the inner margin, close to the short apical spine which does duty for a nail. The long slender spines or setæ on the inner margin of the first, second, and third joints of the palp show little or no feathering.

First Gnathopods.—The side-plates not large either in this or the following segments; in this pair the lower front corner is directed strongly forwards towards the base of the lower antennæ, the oblique front margin tending to concave. The first joint almost free from the side-plate, narrow at the neck, then widening, but not greatly, the margins almost entirely smooth; the second joint stout, but longer than broad, with some spinules at the hinder apex; the third joint an elongate triangle, about as long as the wrist, but not quite reaching the end of it, attached to the wrist by less than half its front or inner margin, carrying on its surface or margin only two or three slender spines or spinules; the wrist a long oval, broader than the first joint, and almost equal to it in length, the hind margin and the surface carrying groups of slender spines not very closely set; the hand shorter than the wrist, but long and narrow, widening a little distally, with groups of slender spines along the surface near, and at the apex of, the convex front margin; the slightly serrate hind margin, which tends to concave, has also several spaced groups of slender spines on and near it, and some little way above its apex a strong projecting palmar spine; the palm is almost too short to deserve the name, with irregular edge, bordered with slender spines; beyond the palm the curved finger projects, with its inner margin denticulate, and apparently adapted to impinge against the third joint rather than against the hand or wrist, while the point of the third joint is well adapted to hold objects pressed against the hand; the dorsal cilium is very small, near the base.

Second Gnathopods.—Side-plates rather larger than the preceding or following pair, with the margins convex, especially the lower one. The first joint furnished with a few marginal spinules; the second with two or three at the hinder apex; the third with several slender spines on the oblique distal margin; the wrist rather longer than the hand, with nine or ten groups of pectinate spines along the serrate hind margin, two or three groups on the adjacent surface, one more remote consisting of five spines in a row; there are also a couple of groups near the apex of the front margin, and a spinule or two higher up; the hand almost oblong, a little widened at the palm, with nine or more groups of pectinate spines on the serrate hind margin and a palmar spine at the apex, six groups of spines near or on the convex front margin, and four or five on the surface between the two margins; the convex scarcely oblique finely pectinate palm is bordered with spines and spinules; the finger has the inner margin cut into teeth, the

nail, with two or three setules at its base, projects beyond the palm; the dorsal cilium near the base is small.

First Peræopods.—Side-plates rather smaller than the preceding pair, with the hind margin tending to convex. The first joint packed with gland-cells, almost entirely free from the side-plate, in length exceeding the fourth and fifth joints united, with some slender spines and spinules on the margins, of which two at the upper part of the hind margin are longer than the rest, the second joint with one or two setules at the apex behind; the third joint widening distally, longer than the fourth, subequal in length to the fifth, with spinules and slender spines at three points of the hind margin; the fourth joint with a spinule almost at the top of the hind margin, then a group, then two separate spinules, and a large group near the apex; there is also a group at the apex of the convex front margin; the fifth joint, tapering distally, has a spinule high up on the hind margin, three near the apex, and on the convex front margin above the centre one or two spinules and at the apex a small spine and a spinule; the finger is long and tapering, slightly curved, more than half the length of the fifth joint, with a small dorsal cilium close to the base, and an opening within the apex. The other peræopods were missing in the specimen figured, and are therefore described from a different specimen.

Second Peræopods.—Side-plates similar to the preceding pair, but a little smaller. The limb as in the first peræopods.

Third Peræopods.—Side-plates broader than the preceding pair, the front lobe nearly as deep, the hind lobe shallow. The branchial vesicles oval, longer than the depth of the side-plate. The first joint elongate, wider above than below, with small spines at distant unequal intervals on the margins, of which the front is rather more convex than the hinder; the second joint longer than broad, with spinules at the front apex; the third joint longer than the fourth, shorter than the fifth, with a spine at the hinder apex and spinules at some other points; the fourth joint not conspicuously spined; the fifth with spines at four or five points of the serrate front margin; the finger slender, curved, a little more than half the length of the fifth joint.

Fourth Peræopods.—Side-plates and branchial vesicles like the preceding pair but smaller. The limb very much larger than in the third peræopods, especially the third, fourth, and fifth joints, and the finger much more elongate; the first joint more widened at the top; the third joint much longer than the fourth, subequal to the fifth, with small spines at three or four points on the hind margin; the fifth joint with spines at six or seven points on the front margin and three on the hind margin; the finger much more than half the length of the fifth joint.

Fifth Peræopods.—The side-plates scarcely bilobed. The limb like that of the fourth peræopods but considerably longer; the first joint more widened at the top, the third joint not very much longer than the fourth, shorter than the fifth, with spines at six or seven points of the hind margin; the nail more than half the length of the fifth joint.

Pleopods.—Coupling spines small, bent, with two pairs of retroverted teeth below the apical pair; the margin of the peduncles at the corner below these spines a little serrate; the cleft spines three in number; on one ramus of one pair there were four; the joints of the rami numbering from twelve to thirteen, the outer ramus a good deal shorter than the inner.

Uropods.—The peduncles of the first pair rather longer than the rami, with some strong spines along the under and two upper margins, and a large curved spine at the lower apex; the rami nearly equal, with the marginal spines not numerous, and a group at the apex; the peduncles of the second pair not longer than the rami, reaching as far as the preceding peduncles; the rami not reaching so far as those of the preceding pair, the armature similar, the outer ramus rather shorter than the inner; the peduncles of the third pair reaching beyond the preceding peduncles, shorter than or subequal to the rami, which do not reach so far as the preceding rami; the outer ramus rather longer than the inner, with some marginal spines, and at the apex two, below and behind which there is a little seemingly jointed cap, which is not represented on the inner ramus.

The Telson about as broad near the base as the extreme length, the sides converging from the convex upper part to the acute corners of the distal margin, which is convex in the centre; the raised line which runs obliquely from each outer corner on to the upper surface carries a small spine and a cilium by its side.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, two-fifths of an inch. The second specimen which has contributed to the description was a little longer. Both were distinguished from the specimens attributed to the next species by darker colours, but this distinction did not apply to other specimens, which appear in other respects to belong to the present species.

Locality.—The specimen figured was labelled as having been obtained at Kerguelen Island, off Cape Maclear, from a depth of 30 fathoms; the second specimen was also labelled from Kerguelen Island, Royal Sound; depth, 38 fathoms.

Remarks.—The specific name refers to the locality.

A specimen which is probably the female of this species, has in the first gnathopods the second joint with a group of slender spines at the hinder apex, the third joint with a group low down on the hind margin, the oblique distal margin fringed with many spines, the front apex acute, resting on the wrist, not produced along it; the wrist about as long as the hand, fringed along the convex hind margin with long slender spines, of which there are three or four groups on the surface, as well as one at and another near the front apex; the hand widens distally, and has on the front margin three spaced groups of spines, then a long palmar spine, and finally a fourth group of slender spines; near the front margin there are five or six groups, and three or four

on the surface nearer the front, the finger has its inner margin cut into eleven denticles, and the long sharp nail curves across the palmar spine beyond the obliquely convex finely pectinate palm, so as to become parallel with the hind margin. In the second and smaller gnathopods, the long spines of the third joint cross the surface at an angle with the distal margin; the spines along the serrate hind margin of the wrist and hand are more numerous and closely set than in the first gnathopods, the hand is oblong, rather longer than the wrist, the palm is only slightly oblique, and the short finger fits it, its tip when closed only just appearing beyond the spine which defines the palm; the inner margin of the finger is cut into small teeth; the spines on the surface and front margin of both wrist and hand are nearly as in the first gnathopods.

The peræopods seem to agree in shape and proportion with those of the males above described, and in particular the fifth joint of the second peræopod showed the same armature as that figured for the male, *prp.*1. A., differing from that of *prp.*1. C. the female, as I suppose, of the other species. The great size of the finger in the fifth peræopods may also be noticed as a distinguishing characteristic.

Locality.—The specimen came from Kerguelen Island, the depth not specified. The figure of the upper antenna and part of the lower in the Plate, *a.s.* D., was drawn from a female specimen which seems to belong to this species, a specimen also taken at Kerguelen, and labelled as coming from a depth of 120 fathoms.

Aora trichobostrychus, n. sp. (Pl. CIX. figs. B. ♂, C. ♀).

The resemblances between the species of the genus *Aora* as yet described are so great as to suggest the possibility of their in fact constituting but a single true species, widely distributed, and subject to local variation.[1] The difference between male and female in this genus is sufficiently well known, and it is easily understood that there will be variations in the form of the male according to its age, while there is the further possibility that even the adult male may show some variety of form. The probability that the different specimens of *Aora* from Kerguelen Island all belonged to a single species, induced me to figure on a single Plate parts of different specimens which showed variation, and it was not till I had written most of the description, including all the specimens under one species, that the complication of the narrative brought me to a halt. Upon carefully reviewing the different characteristics, I at length came to the conclusion that less confusion was likely to arise from giving two names to one species, if so it should eventually prove, than by describing two distinct species under one and the same name. The following description is intended chiefly to bring out the points of distinction, real or supposed, between this species and *Aora kergueleni*.

Upper Antennæ.—First joint long, slightly curved, moderately thick, with some slender spines at the apex; the second joint longer and much thinner, also slightly

[1] See especially Mr. Chilton's paper, *Ann. and Mag. Nat. Hist.*, ser. 5, vol. xvi. p. 369.

curved, with some slender spines and spinules here and there, the third joint less than a fourth the length of the second; the flagellum much longer than the peduncle, slender, with about thirty-four joints; the secondary flagellum of four slender joints, the last very small, the four together about equal to three of the primary; on one antenna the secondary flagellum had five joints, the first two being short.

Lower Antennæ.—The fourth joint elongate, rather longer than the first of the upper antennæ, with some slender spines on the margins; the fifth a little longer than the fourth, similarly armed; the flagellum of seven joints, together about equal to the fifth joint of the flagellum, the first joint the longest, the joints carrying at the side and tips some stout spines and some that are setiform.

Upper Lip.—The distal margin a little less protruded than in the other species.

Mandibles.—The cutting edge of the left mandible with five strong teeth visible and probably a small sixth tooth on the side of the largest of the others; the secondary plate with five teeth; the cutting edge on the right mandible having three small and four large teeth; the first joint of the palp widens distally, the second joint has on the front margin four groups of spines, that near the apex forming a row of four; the third joint is longer than the second, and near the hind margin below the middle has two spines on the outer surface; rows of pectinate spines, large and small, are on or near the front margin and apex, fringing more than half the joint. The palp therefore is not very like in its armature to that of *Aora kergueleni*.

Lower Lip.—The principal lobes rather narrow at the top, the flattened distal margin carrying about half a dozen spines; the mandibular processes very acute and much curved, strongly divergent.

First Maxillæ.—The second joint of the palp has no spine on the outer margin, on the apical it has nine spine-teeth, and the slender spines below these do not seem to be more than five or six; the inner plate, though not shown in the figure, *mx.*1. C., is as in other species.

Maxillipeds.—The inner plates have in a male specimen only three spine-teeth on the distal margin, but in a female specimen they have four, so that this is no doubt a variable character.

First Gnathopods.—The side-plates are not so strongly produced forwards as in the other species. The first joint rapidly widens from the narrow neck; the hind margin is furnished with nine or ten tufts of very long setæ, which at the lower part are so large and so close together as to make a dense brush; the second joint is not stout, and has a group of several slender spines at the hinder apex; the attachment of the third joint to the wrist is very much less than half its length, and beyond the attachment the process of the third joint is exceedingly narrow; near the commencement of the process the third joint has more than a dozen slender spines; the spines of the wrist are much more numerous than in the other species; the hand widens more at the distal end,

having consequently a rather longer palm, which at the same time is more oblique; over this the finger closes, bending down beyond the palmar spine and approaching but not reaching the margin beyond it.

Second Gnathopods.—The branchial vesicles narrow, much longer than broad, shorter and narrower than the first joint. The first joint has many slender marginal spines, two longer than the rest near the top of the hind margin; on the wrist and hand near the front margin the spines are longer, more numerous, and more setiform than in the other species, the hand is more slender and the palm more oblique, the finger more curved, with its nail not projecting, but passing the base of the palmar spine and resting within the hind margin.

First Peræopods.—Branchial vesicles rather wider than in the preceding segment. The first joint not longer than the third and fourth united, the front margin straight, with spinules at intervals, the hind margin carrying some slender spines, and one longer than the rest near the top; the third joint quite as long as the fifth and scarcely longer than the fourth; the fourth joint having near the top of the front margin a very small spine, below this in succession a longer one, two small groups, a spinule, and a group of several slender spines; the fifth joint has on the upper half of the hind margin four slender spines, graduated in length, the longest lowest.

Fourth Peræopods.—The third joint with slender spines at two points of each margin, and a spinule at two other points of each margin; the fourth joint with very small slender spines at two points and hairs at two points of the front margin, with a large group of long slender spines at the apex, at the apex behind there is a group of three short bent spines and some that are setiform; the fifth joint has some small spines at six points of the front margin, a large group of setiform spines at the apex behind, and higher up one or two spines and one or two spinules; the nail is less than half the length of the fifth joint.

Fifth Peræopods.—The margins of the first joint not serrate nor carrying stout little spines as in the other species, but in both male and female almost absolutely smooth except for a few little setules; the third joint subequal in length to the fifth; the nail much less than half the length of the fifth joint.

Pleopods.—One of the rami examined had only two cleft spines; the joints numbered from eleven to twelve.

Uropods.—In none of the pairs are the peduncles longer than the rami; the outer ramus of the third pair has, besides the two small spines and the cap, three more slender spines apically feathered; that these are not represented in either specimen of the other species, may, however, be accidental.

The Telson longer than its breadth.

Length.—The female specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, three-tenths of an inch.

Locality.—Off Christmas Harbour, Kerguelen. Two specimens, male and female.

Remarks.—The specific name is derived from the Greek τριχοβόστρυχος, a word meaning *with locks or clusters of hair*, and here referring to the ornamentation of the gnathopods.

That which I suppose to be the female of this species is fig. C of the Plate. It differs little from the female of the other species, except in the proportions of the joints of the peræopods, the fourth and fifth pairs having here a much smaller finger; the fifth joint in the first and second pairs is armed as in the male of this species and not as in *Aora kergueleni;* the more elongate telson is another characteristic. The marsupial plates are here, and no doubt in the other species also, very broad as well as long, being longer as well as greatly broader than the first joint in the first or second peræopods.

Genus *Autonoe*, Bruzelius, 1859.

1859. *Autonoe*, Bruzelius, Skand. Amph. Gamm., p. 23.
1862. *Microdeutopus* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., pp. 165, 166, 379.
1862. „ „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 291.
1869. *Microdeuteropus* (*pars*), Norman, Last Report on Dredging among the Shetland Isles, p. 282.
1870. *Autonoë*, Boeck, Crust. amph. bor. et arct., p. 158 (238).
1876. „ Boeck, De Skand. og Arkt. Amph., p. 572.
1876. *Microdeuteropus*, Stebbing, Ann. and Mag. Nat. Hist., ser. 4, vol. xvii. p. 73.
1879. *Autonoë*, Sars, Crust. et Pycn. nova, p. 458.
1879. *Microdeutopus*, G. M. Thomson, Ann. and Mag. Nat. Hist., ser. 5, vol. iv. No. 23.
1880. *Microdeuteropus*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 271.
1881. *Microdentopus*, G. M. Thomson, Trans. New Zealand Inst., vol. xiii. p. 217.
1882. „ Chilton, Trans. New Zealand Inst., vol. xiv. p. 173.
1882. *Microdeutopus* (*pars*), Haswell, Catal. Australian Crustacea, p. 263.
1882. *Autonoë*, Sars, Oversigt af Norges Crustaceer, pp. 30, 111.
1885. *Aora* (*pars*), Chilton, Ann. and Mag. Nat. Hist., ser. 5, vol. xvi. p. 375.
1885. *Autonoë*, Sars, Den norske Nordhavs-Exp., p. 203.
1886. *Aora* (*pars*), Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.
1887. *Autonoe*, Bonnier, Catal. des Crust. Malac. Concarneau, p. 105.[1]
1887. *Microdeutopus* (*pars*), Chevreux, Catal. Crust. Amph. marins Bretagne, p. 25.

For the original definition of the genus, see Note on Bruzelius, 1859 (p. 312). *Gammarus longipes*, Liljeborg, 1852, is the only one of the five species placed by Bruzelius in the genus which Boeck allows to remain in it. With this Boeck identifies the *Microdeutopus websterii* of Spence Bate. Norman in discussing the latter (Shetland Dredging Report, 1869, see Appendix) says—"I question whether there are sufficient

[1] M. Jules Bonnier's Catalogue only reached me on December 12th, 1887, or it would have been referred to in earlier lists of synonyms, as accepting the generic names *Stenothoe*, *Halirages*, *Tritæta*, *Elasmopus*.

grounds for separating the genus *Aora* from *Microdeuteropus*. We have seen that the females of [the] two are almost undistinguishable; and if *Aora* be divided from *Microdeuteropus* because the tooth-like projection proceeds from the meros [third joint] and not the carpus [wrist], *M. Websterii* must in justice have a similar distinction conferred upon it, because in that species the tooth-like projection does not spring from either meros or carpus, but from the hand." Mr. Chilton in 1885 definitely unites the genera *Aora* and *Microdeutopus*, and would, it may be presumed, make *Autonoe* also a synonym of *Aora*. Boeck adopted the other alternative suggested by Mr. Norman, and allowed *Gammarus longipes* to have the distinction of a separate generic name on account of the hand of the first gnathopods; his definition is as follows:—

"*First Gnathopods* larger than the *Second;* the fifth joint in both sexes forming the hand, which is stronger in the male than in the female.

"The *Third Uropods* with the outer ramus longer than the inner.

"In other points almost as in the genus *Microdeutopus*."

Practically the generic character must be reduced to the description of the first gnathopods, since in the description which Boeck gives alike of *Autonoe longipes*, Liljeborg, and of his own *Autonoe plumosa*, it is clear that the difference in length between the two rami of the third uropods is insignificant. None the less I am much more doubtful than I formerly was of the expedience of combining the three genera *Aora*, *Microdeutopus*, and *Autonoe*, since the character of the first gnathopods in the male of *Aora* is so peculiar, that, as more and more species in the group become known, there will be a continual tendency, I imagine, to draw the *Aora*-form apart from the other two, and then the severance also of those two becomes, as Norman points out, a logical consequence.

The definition of *Microdeutopus*, to which Boeck refers in defining both *Aora* and *Autonoe*, is as follows:—

"*Upper Antennæ* longer than the *Lower;* the third joint of the peduncle short.

"*First Gnathopods* larger than the *Second;* the wrist of the male very dilated, produced at the lower hinder angle; the fifth joint or hand narrower than the wrist and together with the finger forming a two-jointed thumb (una cum ungve pollicem 2articulatum formanti); the fifth joint in the female very dilated and forming the hand.

"The *First* and *Second Peræopods* with the finger shorter than the fifth joint.

"The *Third Uropods* with the inner and outer ramus almost equal in length."

Autonoe philacantha, n. sp. (Pl. CX.).

Rostrum scarcely perceptible, lateral lobes of the head small, acute, lower angles still more acute; the postero-lateral angles of the first three pleon-segments rounded, especially those of the third segment.

Eyes narrow and small, reniform, set obliquely on the lateral lobes of the head.

Upper Antennæ.—The first joint longer than the head, tapering distally, with spines at five points of the lower margin, a row of feathered cilia near the base of the convex upper margin; the second joint thinner, but much longer than the first, with slender spines at intervals on the lower margin; the third joint scarcely half as long as the first; the flagellum of numerous joints, more than eighteen, together longer than the peduncle; the secondary flagellum slender, of seven slender joints, together equal in length to the first four of the primary, the first and last joints the shortest; the slender spines, both short and long, as well on the flagellum as on the peduncle, have a conspicuous accessory thread near the apex.

Lower Antennæ shorter than the upper; the peduncle longer than that of the upper antennæ; the first two joints short, the gland-cone narrow, decurrent; the third joint longer than the preceding two united, with two groups of spines on the under side and another at its apex; the fourth and fifth joints thinner, much longer, about equal to one another, a little shorter than the second of the upper antennæ, armed with long spines on the lower margin, and with short ones on both; the flagellum of nine joints, together not much longer than the fifth joint of the peduncle, tipped with setæ or setiform spines and strong curved spines, which on the upper joints are long; there are also short spines on the sides of the joints.

Upper Lip.—The distal margin broad, very slightly convex, and almost imperceptibly emarginate at the centre, being furred within and on either side of the emargination.

Mandibles.—Cutting edge broad, with six teeth, of which one is especially prominent; the secondary plate has four unequal teeth, which are strong on the left mandible, and long on the right; the spine-row of twelve long, strongly denticulate spines; the molar tubercle prominent, with long denticles surrounding the somewhat narrowed crown, and several rows or ridges of smaller ones crossing the surface; on the outside of the tubercle, above the plumose seta, there is a small plate or process with a denticulate edge; near to the base of the palp there rises a prominent process with rounded apex; the first joint of the palp short; the second long, fringed on two edges with numerous spines of various lengths; the third rather shorter and much narrower, the apex acute, carrying one or two long feathered spines, the front margin nearly straight, fringed with many spines, most of them pectinate; the outer margin convex, but a little below the centre somewhat bent in, there being here a great group of cilia and pectinate spines, which give the joint the appearance of being divided into two; there are on the outer surface other groups of spines both above and below the bushy group.

Lower Lip.—The principal lobes are distally rather narrow and dehiscent; from the curve which may be reckoned either to the distal or inner margin projects a row of seven close-set spines on one lobe and eight on the other, the two or three lowest having curved

tips. The inner lobes are strongly ciliated; the mandibular processes are very long, thin, and divergent, but with a slight inward curve.

First Maxillæ.—The inner plate small, with a long plumose seta on the apex; the outer plate broad, having on the truncate distal margin ten denticulate spines, of which one is simply furcate, two have one denticle apiece on the outer margin, the rest have from two to six denticles on the inner margin not very near to the apex; the first joint of the palp very short, the second long, not distally widened, curving over the outer plates, the distal margin carrying on one maxilla seven, on the other eight, spine-teeth, the outermost the longest; a series of seven slender spines begins on the outer surface a little way down the inner margin, and passes across towards the outer apex.

Second Maxillæ.—The inner plate rather shorter than the outer, with a series of plumose setæ beginning near the base of the inner margin and passing across the surface towards the outer apex; a series of spines begins below the middle of the inner margin and passes round the margin nearly to the outer distal corner; the outer plate has the distal margin fringed with long spines, and some shorter ones descend the outer margin for a short space.

Maxillipeds.—The inner plates broad, reaching nearly as far as the apex of the first joint of the palp, the distal margin broad, sloping away a little at the outer corners, carrying three spine-teeth and several slender feathered spines, the inner margins having plumose setæ and a spine-tooth close to the apex; the outer plates very broad, not reaching the end of the second joint of the palp, fringed on the serrate inner margin with about a dozen spine-teeth, the series being continued by five spines on the distal margin, below which on the very convex outer margin are three more, spaced, the lowest shorter than the preceding; the first joint of the palp short, the second long and rather broad, carrying spines at the outer apex and along the inner margin; the third joint longer than the first, expanding distally, and produced in a small pointed cap over the base of the finger, armed with feathered or pectinate spines before and behind, on the surface and at the apex; the finger is slender, slightly curved, tapering, tipped with a small very sharp nail, near the base of which the inner margin carries two or three setules.

First Gnathopods larger than the second. The side-plates small. The first joint reaching much beyond the side-plate, with small groups of spines at points of the hind margin and spinules in front; the short second joint with an apical group of several small slender pectinate spines; the third joint small, with many spines on the hind margin and its rounded apex, and on the surface near the front, the apex in front acute; the wrist massive, not quite so broad as long, nor so long as the hand, with five groups of spines on the convex front margin, the serrate hind margin thickly fringed with serrate spines, of which there are also groups on the surface and broad lower margin; the hand massive, with some seven rows of long spines at or near the convex front margin; the serrate hind margin is fringed with several groups of spines, and apically forms a triangular tooth the

inner side of which is serrate, and within which is set a strong palmar spine projecting beyond the tooth, and from this the finely but irregularly denticulate palm takes an oblique sinuous course to the hinge of the finger; besides the marginal groups of spines there are others on the surface and adjoining the palm, which is also fringed with short spines; the finger is much curved, and its sharp tip closes on to the surface at the base of the palmar spine, leaving a narrow space between the concave part of the palm and the distal inner margin of the finger; the inner margin almost to the nail is cut into numerous decurrent teeth, with spinules at the base of some of them, the dorsal cilium is lightly feathered, short but rather stout, near the base of the finger.

Second Gnathopods.—Side-plates small, rather broader and deeper than the preceding pair. First, second, and third joints of the limb much as in the first peræopods; the wrist nearly as long, but a good deal less broad, similarly armed, the spines of the hind border forming nine groups; the hand is as long as the wrist, almost oblong, with several groups of spines at or near the convex front margin, twelve groups along the serrate hind margin, which is not as in the first gnathopods very much shorter than the first; there are several other groups of spines along the surface and near the palm; the hind margin on one of the limbs produced into a small tooth, on the other it is not produced into a tooth, but it forms a definite angle, almost a right angle, with the slightly sinuous, finely pectinate, spine-bordered palm; the finger is stout, curved, of a length to fit the palm, the inner margin cut into teeth with a setule to every second or third tooth, and two or three longer setules near the base of the sharp nail, in respect to these and the dorsal cilium resembling the first gnathopods.

First Peræopods.—Side-plates like the preceding pair. First joint reaching much beyond the side-plate, pretty evenly broad except at the neck, packed with gland-cells, with some spinules along the front margins, some small spines along the hinder, and some moderately long setæ at the upper part of both; the second joint short, with a slender spine or two at the apex; the third joint much longer than the fourth or fifth, like the two preceding joints having abundance of gland-cells, which are dark in the preserved specimen; there are spinules and slender spines on both margins but in no great numbers; the fourth joint is much broader but a little shorter than the fifth, having the almost straight hind margin fringed with slender spines, the front margin more convex and carrying a spinule above and two or three small groups of spines below; the fifth joint narrows a little distally, and has nine or ten groups of slender spines on the hinder and two on the front margin; the finger is slightly curved, not half the length of the fifth joint, with a feathered cilium near the base, and an opening within the apex for the excretion from the gland.

Second Peræopods.—Side-plates wider than deep. The limb nearly as in the preceding pair.

Third Peræopods.—Side-plates broad but shallow, the front lobe a little deeper but

not much broader than the hind one, having many setæ on the inner surface, the hind lobe having a few, and a small spine at the further corner of its flat lower margin. The branchial vesicles broad, shorter than the first joint of the limb. The first joint little more expanded than in the preceding pairs, the spines few and small on either margin; the second joint with a small apical group in front; the third joint longer than the fourth but scarcely so long as the fifth, with two groups of slender spines and two of spinules on the slightly convex front margin, the hind margin interrupted at two points to receive short stout spines, and, besides one or two on the adjoining surface, having such with some long slender ones at the apex; the fourth joint with some mixed groups in front and at the apex behind, and some stout spines on the surface; the fifth joint with four groups in front, others near the hind margin, and a large tuft of long slender spines at its apex; the finger short, sharp, bent upwards, with a dorsal cilium near the hinge and another near the base of the nail.

Fourth Peræopods broken. The first two joints similar to those of the preceding pair.

Fifth Peræopods.—Much longer than the third. The first joint long but little expanded, with thirteen or fourteen spines along the hind margin, and rather fewer and smaller ones along the front; the second joint with setiform spines at the front apex; the third joint long and slender, with six prominent groups of spines on the hind margin and single spines at two or three other points; the front margin has some spinules and setiform spines; the fourth joint long, but considerably shorter than the third, with spines at intervals on both margins, but more prominent on the hinder; the fifth joint broken.

Pleopods.—The peduncles carrying numerous plumose setæ; the coupling spines bent, the heads much broader than the shafts, with three lateral retroverted teeth on each side below the apex; the cleft spines five in number in each pair; the joints of the rami nineteen in number on each ramus; the outer ramus, having a shorter first joint than the inner, is in each pair shorter than its companion; on the first joint of the inner ramus in the third pair some surface spinules were observed, one of which appeared to be cleft.

Uropods.—The peduncles of the first pair longer than the rami, with many spines along the two upper margins, and a large curved apical spine; the outer ramus a little shorter than the inner, six spines on the outer margin, two that are more slender low down on the inner, and a group of five at the blunt apex; the outer ramus has five and four spines on the margins and five at the apex; the peduncles of the second pair subequal in length to the rami, armed like the first pair; of the subequal rami one has seven spines on one margin, three on the other, and five at the apex; the other ramus has five and four on the margins and five at the apex; the peduncles of the third pair shorter than the rami; the rami short, the shorter with slender spines at two points of the outer and one point of the inner margin, and a group of five at the rounded apex, three being

long and setiform; the longer ramus has three spines on the outer and four on the inner margin, and half a dozen setiform spines at the rounded apex; of these rami, it is the outer apparently that is the shorter, not the inner as would be required by Boeck's account of this genus.

Telson not reaching beyond the peduncles of the third uropods, scarcely longer than broad, the apical margin forming three points, of which the central is a little the most produced; at each outer corner there is a cilium, and along the raised line which runs obliquely from each corner upon the upper surface there are on each side five setiform spines.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, nine-twentieths of an inch.

Locality.—Station 162, off East Moncœur Island, Bass Strait, April 2, 1874; depth, 38 fathoms; bottom, sand and shells. One specimen.

Remarks.—The specific name, from the Greek φιλέω, I love, and ἄκανθα, a spine, seems justified by the bush of spines on the mandibular palp and the row of spines on the lower lip, as well as the more usual spininess of the gnathopods.

The species has much resemblance to *Autonoë plumosa*, Boeck, from which, however, the antennæ and first gnathopods separate it, and likewise to *Microdeutopus australis*, Haswell, from Port Jackson, which is likewise an *Autonoe*, but distinguished from the present species by having the third joint of the peduncle of the upper antennæ "very short," by the first gnathopods, in which the wrist is described and figured as being larger than the hand, by having "second pair of pereiopoda longer than the first; dactylos in both long, slender," and lastly by having the rami of the third uropods "lanceolate."

Autonoe kergueleni, n. sp. (Pl. CXI.).

Rostrum small, lateral lobes of the head small, acute; in the first three pleon-segments the lower lobe of the hind margin taking the place of the postero-lateral angles, the separation between the lobe and the true lower margin being marked by a minute notch and setule; the third pleon-segment is longer than either of the two preceding segments; the fourth segment has a transverse dorsal depression.

Eyes small, situated on the lateral lobes of the head.

Upper Antennæ.—The first joint large, longer than the head, with some spinules and spines, chiefly on the under margin. The remainder of these antennæ broken off.

Lower Antennæ.—The first two joints short, the gland-cone small, acute, decurrent; the third joint broad, not twice as long as broad, armed with some slender spines; the fourth and fifth joints long, subequal in length, the fifth the thinner, both equipped with

slender spines, some of them long; the flagellum of seven joints, together not equal to the fifth joint of the peduncle, several of them tipped with curved spines, which on the last joint are short.

Upper Lip as in *Autonoe philacantha.*

Mandibles.—The cutting edges do not appear to have more than five teeth, the secondary plates four, or on the right mandible, perhaps only three; the spines of the spine-row five on the left, six on the right, mandible, slender, not very conspicuously denticulate, curved, and directed backwards; the molar tubercle prominent, with strongly denticulate crown and a plumose seta; the first joint of the palp a little dilated distally, the second joint with a few long and short spines along the front; the third joint as long as or longer than the second, and nearly as broad for much of its length; the front margin carrying four and the apex two long pectinate spines, the distal half of the inner margin being fringed with some fifteen short pectinate spines, the length slightly increasing as they approach the apex; besides these there is below the centre a transverse row of four unequal but very long curved pectinate spines near the outer margin, and above the centre a spine on the surface near the inner margin.

Lower Lip.—The principal lobes rather broad distally, the inner part of the distal margin and the inner margin ciliated, without spines; the inner lobes ciliated; the mandibular processes long, pointed, divergent.

First Maxillæ.—The inner plate small, with a long, not strongly plumose, seta on the apex; the outer plate with ten spines on the distal margin, constructed on the same general plan as those in *Autonoe philacantha*, but seemingly with only two or three lateral denticles where in the other species there were three or four; the first joint of the palp short, with a small spine on the outer apex, the second joint curving over but not much beyond the outer plate, a good deal broader distally than at the base, the indentured distal margin in one maxilla having six, in the other five, spine-teeth, the outermost the longest; there are five slender spines on the surface nearer to the inner than to the outer apex.

Second Maxillæ.—The inner plate shorter but slightly broader than the outer; a row of twenty-one setæ passes almost from the base of the inner margin across in a curve towards the outer apex; there are also some slender spines on the inner margin and round part of the apical margin; the outer plate has a straight inner margin, near the apex of which begins a series of half-a-dozen subapical spines, the apical margin itself, which is rounded with an outward slope, carrying several more.

Maxillipeds.—The inner plates broad, reaching as nearly as possible the distal end of the first joint of the palp, with several long setæ along the inner margin, and a bent spine-tooth just below the apex; the distal margin broad, occupied by three strong spine-teeth and a few slender setiform spines; the outer plates very broad, not reaching the end of the palp's second joint, with seven spine-teeth on the inner margin, and

two longer ones on the broad distal margin, followed by four successively more and more setiform; the first joint of the palp short, the second much longer, fringed with long slender spines on the inner margin; the third joint little longer than the first, dilated distally, the convex outer margin longer than the inner, but not produced over the base of the finger, the inner margin without spines, except near the apex; the finger, including the spine-like nail, is as long as the third joint, it has a couple of setules on the inner margin near the base of the nail, and a small dorsal cilium so close to the base that it might almost be supposed to belong to the third joint.

First Gnathopods larger than the second. The side-plates small, directed forwards at the front lower corner. The first joint almost entirely free from the side-plate, the front margin straight, unarmed, the hind margin convex, with a solitary seta high up; the second joint short, with a group of slender spines on the hinder apex; the third joint a little longer than the second, its two convex margins meeting at an acute apex, with groups of spines on the hind margin and on the inner surface above the apex; the wrist stout, much shorter than the hand, the hind margin closely fringed with spines in groups; the hand broader than the wrist, widening a little from the base, the front margin very convex, with a few spines on the apex, and groups on the surface at a little distance; the hind margin straight, carrying two or three groups of spines at intervals, and apically produced into a long tooth, with a spine on the outer side; there is a deep cavity on the inner side, of which the further margin is sinuous, apically forming a small tooth, beyond which the remainder of the palm is sinuously denticulate; the finger is short, curved, with seven or eight minute spine-teeth at intervals along the inner margin; it closes tightly against the denticulate part of the palm, but leaves open part of the cavity above-mentioned before the nail reaches the tooth-process of the hind margin; about the palm and on the surface of the hand near the hind margin there are various spines, slender and not numerous.

Second Gnathopods.—Side-plates small, rather wider above than below, the front margin a little concave. Branchial vesicles small, narrowly oval. The first joint almost entirely free from the side-plate, dilated after the manner usual with the last three pairs of peræopods, and as found also on the second gnathopods of *Gammaropsis exsertipes;* narrow at the base, and to a less extent distally, the margins having a few spinules, and the hind margin a setiform spine above the centre; the second and third joints nearly as in the first pair, but the third having its lower margin much more distinct from the hinder; the wrist little shorter and broader than the hand, with seven groups of spines on the convex hind margin, and some groups on the surface near it; the convex front margin armed along the lower two-thirds with many long curved spines; the hand, which is somewhat curved, of nearly even width throughout, has the long convex front margin armed with numerous long spines in many groups; the serrate and nearly straight hind margin carries four groups of slender spines, and has one or two stout palmar spines at

the slightly blunted angle which it makes with the finely pectinate, nearly straight palm; the finger is stout and short, with a rather long dorsal cilium near the base; its inner margin cut into teeth, the tip of the nail projecting just beyond the palm; the surface of the hand has several slender spines besides those on the margins.

First Peræopods.—Side-plates smaller, branchial vesicles larger, than in the preceding segment. The first joint of the limb nearly free from the side-plate, well packed with gland-cells, the front margin straight, the hinder slightly convex, both armed with small spinules, the hinder having also a seta or setiform spine high up; the second joint short, with apical spinules; the third longer than either the fourth or fifth, dilated a little distally, with slight spines at either apex, and a spinule on each margin; the fourth joint shorter than the fifth, with spines at two points on the hind margin and at the apex in front; the fifth joint with slender spines at three points on the upper half of the straight hind margin and one of the convex front, some spinules on either side of the narrowed rounded apex; the finger narrow, more than half the length of the fifth joint, with a dorsal cilium near the base, and an opening at the tip.

Second Peræopods not materially differing from the first.

Third Peræopods.—The side-plates broad, the front lobe deeper than the hinder, as deep as the preceding side-plates. The branchial vesicles narrowly oval, much shorter and narrower than the first joint of the limb. The first joint not greatly expanded, more than twice as long as broad, the sides slightly convex, with some slight spines at the front apex and spinules elsewhere; the short second joint with similar spines at the front apex; the third joint broader and longer than the fourth, not longer than the fifth, with some small spines at each apex, and one or two spinules on the front margin; the fourth joint with strong spines at two points near the hind margin and two at its apex with a slender spine; the fifth joint with spines at four points of the front margin, these being stronger than those of the upper joints, and with a group of longer spines at the apex of the convex hind margin; the finger upward bent, less than half the length of the fifth joint.

Fourth Peræopods much longer than the third. The side-plates and branchial vesicles smaller than in the preceding pair. The first joint with several plumose setæ or setiform spines on the hind margin, otherwise like the first joint of the preceding limb, but longer and wider; the third joint elongate, much longer than the fourth, subequal in length to the fifth, with slender spines at four points of the hind margin, slenderer spines at two points of the front margin, and spinules elsewhere; the fourth joint similarly armed in front, but behind having a strong spine at two points near the hind margin, and two strong spines and some slender ones at its apex; the fifth joint with spines at five points in front and some spinules behind; the finger acute, upward curved, not half the length of the fifth joint, with a long dorsal cilium at the base.

Fifth Peræopods much longer than the preceding pair, and twice as long as the third

pair. Side-plates small. All the joints of the limb longer than in the fourth peræopods, but the third, fourth, and fifth joints especially so; the third joint is longer than the fourth but shorter than the fifth; the fourth joint is elongate, with spines at four points of the hind margin or near it; the fifth joint has spines not regularly spaced at seven points of the front margin; the finger is scarcely one-third the length of the fifth joint.

Pleopods.—Coupling spines slender, bent, with an apical pair of retroverted teeth and a similar pair a little below the apex; the cleft spines are three in number on the first pair and two only on the third; there are some small surface spines on the first joint of the inner ramus; the joints of the inner ramus ten in number, of the outer and shorter only nine.

Uropods.—The peduncles of the first pair a little longer than the rami, with few marginal spines, a large spine at the lower apex; the rami equal in length, or nearly so, the inner with five spines along one upper margin, two or three near the top of the lower, and a large apical group, the outer ramus with two spines low down on one margin and an apical group; the peduncles of the second pair not so long as the inner ramus, with two spines at the inner apex and a large one at the outer; the longer ramus has four spines on one of the upper margins, two on the other, two near the top of the lower margin, and a large apical group of five; the shorter ramus has three spines on the upper margin and an apical group of five; the peduncles of the third pair shorter than the short rami; the inner ramus rather the shorter, with two rather elongate spines below the centre, and five at the blunt apex, one with a setiform termination; the outer ramus similarly armed, but with the terminal spines longer, three of them with setiform ends.

The Telson very little longer than broad, reaching beyond the peduncles of the third uropods, the centre of the distal border convex, the extremities acute, with a long setiform spine projecting from the surface above and within each; there is also a marginal cilium or two a little higher up.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, one-fifth of an inch.

Locality.—Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. One specimen.

Remarks.—The specific name refers to the place of capture. A female specimen from the same locality, which I regard as probably belonging to this species, has the wrist of the first gnathopods nearly as long as the hand, the hand itself dilated at the palm, which has no dental process, but is finely pectinate as in the second gnathopods, the nail of the finger reaching beyond it and antagonising with a long palmar spine.

Genus *Gammaropsis*, Liljeborg, 1855.

1855. *Gammaropsis*, Liljeborg, Öfversigt af de inom Skand. art. af slägtet Gammarus, Kgl. Vet.-Akad. Handl. för år 1853, p. 443.
1855–6. „ Liljeborg, Om Hafs Crust., vid Kullaberg i Skåne, Öfv. af Kgl. Vet.-Akad. Förh., Tolfte Årg., p. 455.
1857. *Eurystheus*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 11 (sep. copy).
1857. „ White, Popular History of British Crustacea, p. 181.
1859. *Autonoe* (*pars*), Bruzelius, Skand. Amph. Gamm., p. 27.
1860. *Gammaropsis*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 659.
1862. *Eurystheus*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 196.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 353.
1870. *Gammaropsis*, Boeck, Crust. amph. bor et arct., p. 160.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 580.
1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 150.
1878. *Eurystheus*, Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 53.
1882. *Gammaropsis*, Sars, Oversigt af Norges Crustaceer, pp. 30, 111.
1884. *Eurystheus*, Chevreux, Assoc. franç. Congrès de Blois, Amph. du Croisic, p. 3.
1884. *Paranænia*, Chilton, Trans. New Zealand Inst., vol. xvi. p. 258.
1885. *Eurystheus*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 413.
1886. *Gammaropsis*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.
1887. „ Bonnier, Catal. Crust. Malac. Concarneau, p. 107.
1887. „ Chevreux, Catal. Crust. Amph. Bretagne, p. 27.

For the original definition of this genus, see Note on Liljeborg, 1855 (p. 286). For the definition of *Eurystheus*, see Note on Spence Bate, 1857 (p. 294). For the definition of *Paranænia*, see Note on Chilton, 1884 (p. 550). It was rather for a subdivision of the genus *Gammarus* than for an independent genus that Liljeborg gave the name *Gammaropsis*, and this is confirmed by the circumstance that he does not include the name *Gammaropsis* in the table of genera which he drew up for the Gammaridæ in 1865. It is therefore perhaps an open question whether the name *Eurystheus* which Spence Bate proposed for the genus in 1855, though he did not define it till 1857, should not have been allowed priority. As matters stand, it will be, I think, convenient to give the preference to *Gammaropsis*, which has obtained the more general acceptance. Boeck gives the following definition :—

"*Upper Antennæ* with the third joint of the peduncle very long.

"*Hypostome* produced in front and acuminate.

"Fourth pair of side-plates the largest.

"*First* and *Second Gnathopods* in both sexes like one another, but the *Second* the stronger; the fifth joint constituting a subcheliform hand.

"*First* and *Second Peræopods* with the finger of moderate size.

"*Third Uropods* with the outer ramus a little shorter than the inner."

To these characters should be added the presence of a well-developed accessory

flagellum on the upper antennæ, while the similarity in shape between the first and second gnathopods is, to say the least, too slight and vague to be worth insisting on; the new species, *Gammaropsis afra*, has the outer ramus of the third uropods a little longer, instead of a little shorter, than the inner.

To complete Boeck's view of this group, I give his definition of Krøyer's *Protomedeia*, which is as follows :—

"*Second Gnathopods* stronger than the *First* and in the male more robust than in the female.

"*Third Uropods* with the inner ramus shorter than the outer.

"*First* and *Second Peræopods* with the finger tolerably elongate.

"In other respects almost as in the genus *Microdeutopus*."

Gammaropsis exsertipes, n. sp. (Pl. CXII.).

Rostrum little developed, lateral lobes of the head narrow, acute; postero-lateral angles of the first three pleon-segments rounded.

Eyes small, nearly round, situated on the lateral lobes of the head, retaining a little colour in spirits.

Upper Antennæ.—First joint as long as the head, moderately thick, with several setiform spines on the lower margin and upper apex, and a stouter short spine at the lower apex; the second joint thinner but much longer than the first, the lower margin fringed with many slender curved spines, the longest at the distal end; the third joint intermediate in length between the first and second, fringed like the second; the flagellum of seventeen unequal joints, together not as long as the peduncle, the first the longest, all carrying slender spines, and most of them cylinders, the terminal joint tipped with some setæ and a short stiff spine; the secondary flagellum of four very slender joints, together not quite equalling in length the first three of the primary.

Lower Antennæ not quite so long as the upper; the first two joints short, set far back on the underside of the head, the gland-cone narrow, decurrent; the third joint longer than the preceding two united, widening a little distally, with slender spines on the margin, and a short stiff spine at the lower apex; the fourth joint prismatic rather than cylindrical, nearly as long as the second of the upper antennæ, and with similar spines; the fifth joint a little shorter than the fourth, similar; the flagellum of twelve unequal joints, the first the longest, the spines of the various joints and the terminal armature much as in the upper antennæ.

Upper Lip rather unsymmetrically bilobed.

Mandibles.—The cutting edge with four large teeth and probably two small ones; the secondary plate of the left mandible (figured on the right hand of the Plate) with four strong teeth; the secondary plate of the right mandible apically bifid, its upper or

outer edge denticulate; the spine-row of four denticulate spines and a small seta; the molar tubercle prominent, the crown set with numerous denticles which appear to be stronger round the margin than over the concave surface; there is a feathered seta on the side; in the right mandible the molar tubercle has, attached to the margin on its outer surface, a small thin plate expanding distally, striated, with finely pectinate edge, similar to that observed in *Photis macrocarpus;* a broad-headed process rises near the base of the palp; the palp is of great size compared with the trunk of the mandible; the first joint short, widening a little distally; the second joint long, with seven groups of spines on the hind margin, the front fringed for its whole length with a double row of spines of various lengths, at the lowest part having a row of five which are straight and graduated in length, the lowest the shortest; the third joint shorter than the second, but long, widening distally, with four spines on the outer surface near the base and the outer margin, three on the inner surface also near the outer margin but a little way below the apex, the apex itself set about with many long feathered and pectinate spines, groups of which descend the inner margin for three-quarters of its length.

Lower Lip.—The distal and inner margins of the principal lobes rather flattened, not strongly ciliated; the inner plates distally broad; the mandibular processes long, narrow at the tips.

First Maxillæ.—The inner plate small, with the outer margin convex, the inner straight, armed near the apex with a spine-like seta, below which is a much shorter one, the apex narrow and unarmed; the outer plate has only nine spines on the apical border, three of them apically forked, the rest with one or two lateral teeth on the inner margin; the long second joint of the palp expands distally, curving over the outer plate, the distal edge having five spine-teeth followed by three more slender, which descend the inner margin, while a series of nine slender plumose spines, beginning on the upper part of the inner margin, crosses the surface towards the outer apex.

Second Maxillæ.—The inner plate shorter and narrower than the outer, fringed with spines round the apex and down the inner margin below the middle; the broad, slightly convex distal margin of the outer plate fringed with long spines, one series of which passes a little way down the inner margin; there are none on the outer margin.

Maxillipeds.—The inner plates oblong, distally a little widened, not quite reaching the apex of the first joint of the palp; a series of a dozen plumose setæ beginning near the middle of the inner margin passes across the inner surface towards the apex; the slightly convex distal margin has three spine-teeth and six or seven feathered spines; the outer plates not nearly reaching the distal end of the palp's second joint, with nine spine-teeth along the inner margin, and seven longer spines round the distal border; the first joint of the palp short; the second long with many spines on the inner margin, and one or two at the apex of the outer and at a point below it; the third joint not longer than the first; scarcely expanded distally, with long spines about the apex and the distal half of the

inner margin; the finger nearly as long as the third joint, narrowing very gradually till the apical part, which carries four slender spines on the oblique inner margin, and at the tip no nail but a strong spine, which is long but not nearly so long as the body of the finger, nor so long as a slender spine next to it.

First Gnathopods.—Side-plates small, directed forwards, but not covering the base of the lower antennæ. The first joint narrow at the neck, extending much beyond the side-plate, with many long setæ on the convex hind margin, and others along the surface; the second joint with a large apical group of spines; the third joint with the two convex margins converging to a pointed apex, carrying many groups of spines on the surface and along much of the hind margin; the wrist almost as long as the first joint and distally wider, the long front margin little convex, with a group of spines at the apex, and some spinules elsewhere, the convex serrate hind margin fringed with numerous groups of spines, of which there are several also on the surface and hinder apex; the hand rather shorter than the wrist, the front margin convex, with six or seven groups of spines in rows on the adjacent surface; the hind margin much more convex than the front, the major part of it, which may be regarded as the palm, being finely pectinate, the surface immediately adjacent and at a little distance carrying several groups of spines, besides which there are many single spines and spinules at intervals along the margin; the finger is of great size, in the larger specimen (but not in the female) longer than the hand, and no doubt adapted for impinging against the wrist or to hold fast an object pressed against the wrist; the dorsal cilium is small, near the base; the inner margin is cut into seventeen little teeth, resembling spine-teeth, with a hair or cilium adjacent to each, or with few exceptions; at a little distance from the base of the sharp nail two or three setules are inserted.

Second Gnathopods not much longer, though very much broader, than the first pair. The side-plates deeper and much broader than in the preceding segment, broader than deep, the lower margin rather concave in the middle. The first joint almost entirely free from the side-plate, and expanded in a very abnormal manner, more like the first joint of one of the hinder peræopods than like that of a gnathopod; the breadth is greatest a little way below the narrow neck or point of attachment, from which the upper margin at once spreads out on either side; the hind margin, which is slightly convex, has some long setæ at the upper part, and two or three spinules below these; the front margin is crenulate, with setules in the notches; the lower margin projects for some distance in front of the second joint, but is much narrower than the upper margin; the second joint has a group of slender spines at the hinder apex; the third is more squared, and with fewer spines than in the first gnathopods; the wrist is short, triangular, distally cup-like, as broad as long, narrower than the hand, with a few spines at and near the front apex, many round the apex of the hind margin, some on the lower margin; the hand is very large, widening from the base, considerably longer than its greatest breadth, which is at

the commencement of the oblique palm; the front margin a little convex, with several groups of spines on or near the distal half, the hind margin nearly straight, carrying some seven large groups of spines, and apically ending in a long narrow tooth, within which is a very small palmar spine; from this the palm runs in a very oblique but even course towards the hinge of the finger, before reaching which it forms a second tooth-like process smaller than the first, by means of the small cavity which precedes the broad irregular process that extends to the hinge; the margin of this long palm is set with spinules and some of the groups of spines which are dispersed upon the broad surface of the hand; there seem to be no strong or broad spines in any part of the limb, the little palmar spine not constituting an exception; the finger is very much curved, and when closed does not reach the small palmar spine, but rests against the surface at some distance from it; its inner margin as in the finger of the first gnathopods.

In the female the first joint, though tolerably broad, is not abnormally so; there is only a small acute tooth process at the commencement of the palm, having a palmar spine at its side, followed by another further on; the second process is wanting, the oblique margin is finely pectinate. The marsupial plates are rather broad and long, with many setæ.

First Peræopods.—The side-plates with the lower margin convex. The first joint rather long, narrow only at the neck, with gland-cells down each side, some moderately long setæ and some spinules on the margins; the second joint rather longer than broad, with a spine or two at the hinder apex; the third joint much longer than the fourth, widening distally, with small groups of spines at three points of the straight hind margin, and at the apex and one other point of the slightly convex front margin; the fourth joint with spines at three points behind and the apex in front; the fifth joint nearly as long as the third, with spines at five points behind and two in front; the finger slender, curved, more than half the length of the fifth joint, with an opening on the inner side of the tip for the excretion from the gland.

Second Peræopods almost the same as the preceding pair.

Third Peræopods.—The side-plates broad, with the front lobe very deep, the hinder quite small. The limb missing in the large specimen, in the smaller resembling in structure the following pairs, but notably shorter.

Fourth Peræopods.—Side-plates very small, scarcely bilobed. The first joint of the limb not greatly dilated, wider above than below, with some small spines along the slightly convex front margin, the hind margin nearly smooth, with a few setules, the convexity chiefly at the upper part; the second joint with some small apical spines in front; the third joint much longer than the fourth, with spines at three points on each margin, those behind in general stronger than those in front; the fourth joint widening like the third distally, with a group of spines at each apex; the fifth joint longer than the third, with spines at five points of the front margin and three of the hinder; the

finger acute, curved at the tip, a little more than half the length of the fifth joint, with a dorsal feathered cilium very near the hinge, and a small hair near the base of the nail.

Fifth Peræopods.—Side-plates very small, not bilobed, the limb scarcely differing from that of the fourth peræopods, but rather longer, and the first joint having the hind margin more flattened at the top.

Uropods.—The peduncles of the first pair longer than the rami, with nine spines on one and ten on the other of the upper margins, a large curved spine on the apex below; the outer ramus shorter than the inner, with a row of eight marginal spines and an apical group of four, the marginal spines of the longer ramus only seven in number; the peduncles of the second pair longer than the outer ramus, but scarcely so long as the inner, with a long spine on the lower apex; the outer ramus with six spines on one margin, three on the other, and the apical group as in the first pair; the inner ramus with seven spines on one margin and four on the other, besides the apical group; the peduncles of the third pair reaching beyond the peduncles of the two preceding pairs, longer than the rami, with one apex acute, and seven spines on one margin including the apex, and four on the other, the two lowest being side by side; the rami are small, subequal, not reaching so far back as the inner ramus of the second pair, each having two marginal spines, and probably one at the apex; the inner ramus slightly longer than the outer.

Telson not nearly reaching the end of the peduncles of the third uropods, a little longer than broad, widest at a little distance from the base, then with the sides almost straight, converging rapidly towards the triangular apex; at about the centre on either side, at a little distance from the margin, there is a strong spine on the surface, and between this and the margin a feathered cilium; the margin below as far as the angle at which the apical triangle begins is armed with little spines or scales, about forty in number on either side.

Length.—The longer specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, two-fifths of an inch.

Locality.—Kerguelen Island; depth not specified. Three specimens, two males and one female.

Remark.—The specific name refers to the remarkable prominence of the second gnathopods, especially in the male.

Gammaropsis afra, n. sp. (Pl. CXIII.).

Rostrum small, lateral lobes of the head narrow, acute; postero-lateral angles of the first three pleon-segments not much rounded.

Eyes deeper than broad, close to the front margin, occupying the space between the rostrum and the front part of the lower border of the lateral lobes.

Upper Antennæ similar to those of *Gammaropsis exsertipes;* but the first joint of the primary flagellum not the longest, and the secondary flagellum not so slender, consisting of six joints, together equal in length to the first four or five of the primary, the terminal joint minute.

Lower Antennæ in general as in *Gammaropsis exsertipes,* but with the fifth joint longer than the fourth, the spines stronger, especially on the flagellum, the three terminal joints of which have each a pair of short spines with accessory threads, the upper joints having both longer and shorter spines similarly furnished.

Upper Lip.—The distal border appears to be evenly convex.

Mandibles.—The cutting edge with five or six teeth; the secondary plate on the left mandible with four teeth, that on the right mandible slighter, with the edge much subdivided, with two principal teeth below, and several denticles above on the edge facing the principal plate; the worn plate has more denticles than the one in preparation; the spine-row has on the left mandible ten, on the right nine, long bent denticulate spines, those nearest the cutting plate very broad; the molar tubercle prominent, with long denticles round the crown; the first joint of the palp short, widest distally; the second joint long, the front margin fringed with many spines of different lengths, the hind margin also having five or six groups; the third joint not so long as the second, but long, expanding distally, with many groups of long spines along the hind margin, and having the rather broad distal margin set with many long spines, the series also passing down nearly to the base of the inner margin, many or most of the spines of the third joint being strongly pectinate.

Lower Lip.—The principal lobes forming a definite angle at the meeting of the distal and inner margins, at which point there are two small spines; the inner lobes widest below the distal margin; the mandibular processes long and narrow.

First Maxillæ.—Inner plate small, with eleven plumose setæ along the sinuous inner margin and a short seta at the narrow apex; the outer plate with nine or ten spines on the distal margin, variously denticulate, some on the outer and some on the inner margin, and some apically; the first joint of the palp short, with a spine near the apex of the outer margin; the second joint long, slightly widening from the base, reaching beyond the outer plates, the distal margin having seven spine-teeth, the outermost the longest, the rest serrate on the outer margin; on the surface below these are seven slender feathered spines.

Second Maxillæ.—The inner plate shorter and a little narrower than the outer, with a series of twenty plumose setæ beginning near the base of the inner margin and passing across the surface towards the outer apex; the inner margin is also fringed with spines from below the middle, and feathered or pectinate spines pass almost round the apex; the outer plate has the apex set with many long spines, but there are none on the lateral margins.

Maxillipeds.—The inner plates widening distally, not reaching quite to the apex of the palp's first joint, with setæ and spine-teeth as in *Gammaropsis exsertipes*, but the spine-teeth broader at the base; the outer plates not nearly reaching the end of the second joint of the palp, with seven spine-teeth on the serrate inner margin, and five or six long curved spines round the serrate apical margin, the two lowest almost setiform; the first joint of the palp short, the second long, with many spines along the inner margin, and a group above the middle, and another at the apex, of the outer margin; the third joint as long as the first, expanding a little distally, set round the apex, the distal half of the inner margin, and on the surface with many spines; the finger very short, with a strong spine projecting from its apex, the spine longer than the body of the finger, the inner margin of which carries four slighter spines near the large one.

First Gnathopods.—Side-plates not produced at the lower corner, neither reaching nor directed towards the basal joints of the lower antennæ. The first joint reaching considerably beyond the side-plate, narrow at the point of attachment but presently widening, with setæ on the upper part of the convex hind margin, and groups of slender spines below, channelled in front and having the front margins a little concave; the second joint with a group of spines near the hinder apex; the third joint with several groups of spines along the hind margin and round the apex; the lower margin concave, forming an acute front apex; the wrist not quite so long as the first joint, subequal in length to the hand, and almost as broad, the front margin having two groups of spines, the surface several broad rows of them, the hind margin numerous groups, some of the spines being strongly pectinate; the hand longer than broad, broadest at the beginning of the slightly oblique and convex pectinate palm, both margins having numerous rows of spines on the adjacent surface; smaller groups occupy the centre of the surface, and the palm margin has scattered spines as well as groups. The finger fits the palm, reaching as far as the point where a palmar spine is inserted, not on the margin, but the surface; its inner margin is divided into small decurrent teeth, and there are some setules near the base of the nail.

Second Gnathopods.—Side-plates a little broader and deeper than the preceding pair, with small setules round the convex lower margin. Marsupial plates short, surrounded with long setæ. The first joint reaching much beyond the side-plate, the front channelled, concave, carrying spinules at intervals, the hind margin convex, fringed with groups of long spines or setæ; the second and third joints as in the first gnathopods, but with fewer spines on the hind margin of the third joint; the wrist much shorter than the hand, distally cup-like, with spines at the apex in front, and along the lower margin on the inner surface, and in six or seven groups along the serrate hind margin; the hand not twice as long as broad, with seven or eight groups of spines along or near the convex front margin on the inner surface, nine large groups along the serrate hind margin, which is not produced into a tooth at the commencement of the oblique palm, which forms an angle with it, and is for a short space concave, then convex,

minutely pectinate, fringed with small spines; the finger is curved, with the usual dorsal cilium; the nail closes down against a palmar spine, set on the surface at some distance from the hind margin. There are scattered groups of spines on the surface besides those already mentioned.

First Peræopods.—The side-plates very similar to the preceding pair. The first joint of the limb reaching much beyond the side-plates, well packed with gland-cells, the hind margin fringed with long spines, the front with short ones; the second joint with an apical group of spines; the third joint much longer than the fourth, with spines at three points behind and the apex in front; the fourth joint like the third widening distally, the hind margin fringed with numerous slender spines, the apex in front carrying a small group; the fifth joint longer than the fourth, shorter than the third, narrowing distally, with some six groups of slender spines on the straight hind margin, a group at the apex of the front convex margin, and another high up on it; the finger more than half the length of the fifth joint, with an opening at the tip, and near the base a long dorsal feathered cilium.

Second Peræopods not specially examined; similar to the preceding pair.

Third Peræopods.—The side-plates broad, the front lobe large, nearly as deep as in the preceding pair, the hind lobe small. The first joint of the limb scarcely longer than broad, dilated above, narrowing distally, with spines, but not stout ones, at intervals on the slightly convex front margin and the upper margin adjoining; the hind margin very convex above, carrying a few spinules, and near the apex a stout spine; the second joint with an apical group of slender spines; the third joint broader than the fourth, but about as long, with spines at the apices; the fourth joint bordered with some short stout spines; the fifth joint much longer than the fourth, with stout spines at three points in front, slender ones at two points behind; the finger short and strong, very much curved, with a dorsal feathered cilium near the hinge, and a smaller cilium near the base of the sharp nail.

Fourth Peræopods.—Side-plates very shallow. The limb missing.

Fifth Peræopods.—Side-plates small and shallow. The limb a good deal longer than that of the third peræopods. The first joint broader above than below, but not greatly dilated at any point, much longer than broad, with spinules on the slightly convex front margin, and setules on the almost straight hind margin, which has a stout spine near the apex; the second joint longer than broad, with an apical slender spine; the third joint longer than the fourth, with stout spines at three points of the hind margin, one at the apex in front, with other slenderer spines on that margin; the fourth joint with spines at two points on the hind margin, and two or three in front; the fifth joint longer than either of the preceding, with four groups of spines in front, and three of slenderer spines behind; the finger not nearly half the length of the fifth joint, longer and less strongly curved than in the third peræopods, but similarly armed.

Pleopods.—The pair examined had many groups of long spines or setæ on the peduncles; the coupling spines small, bent, with an apical pair of retroverted teeth and a similar pair just below the apex; the cleft spines four in number; the joints numbering eleven on the inner, and thirteen on the outer, ramus.

Uropods.—The peduncles of the first pair longer than the rami, with a very large apical spine besides the small ones on the margins; the outer ramus shorter than the inner, with five spines on one margin, three that are more slender on the other, and an apical group of five; the inner ramus with six on one margin, four on the other, and the apical group; the peduncles of the second pair about as long as the inner ramus, armed with some very stout spines; the outer ramus a little shorter than the inner, with four very stout spines on one margin, three more slender on the other, and the apical group; the inner ramus with four spines on one margin, six on the other, and the apical group; the peduncles of the third pair a little longer than the rami, reaching beyond the peduncles of the preceding pairs; the outer ramus a little longer than the inner, with a stout spine on the outer margin, at the blunt apex two stout spines with accessory threads and three more slender which are distally feathered; the inner ramus with two spines on the outer margin, three on the inner, and one at the almost acute apex. In the figure *Pl.*, the inner ramus of the first pair on the left side, and the inner ramus of the second pair on both sides, have been accidentally left without mark of separation from the respective peduncles.

The Telson short, scarcely longer than broad, not reaching the end of the peduncles of the third uropods, the sides converging very slightly, the lower margin forming a broad shallow triangle, with a stout spine just within each outer corner, the apex tolerably sharp; there are some feathered cilia on the lateral margins.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the extremity of the third uropods, three-tenths of an inch.

Locality.—Station 142, off Cape Agulhas, December 18, 1873; lat. 35° 4′ S., long. 18° 37′ E.; depth, 150 fathoms; bottom, green sand; bottom temperature, 47°. One specimen.

Remark.—The specific name refers to the place of capture, just at the south of Africa.

Gammaropsis atlantica, n. sp. (Pl. CXIV.).

This species I was long inclined to identify with *Gammaropsis afra* from the south of Africa, but a minute comparison has induced me to establish it as a separate species.

Rostrum very small, lateral lobes narrow, acute, strongly produced; the postero-lateral angles of the first three pleon-segments rounded; the fourth and fifth carrying the

usual pair of dorsal setæ or spines. The animal covered in many parts of the mouth-organs, as well as the exterior, with dark stellate markings, an enlarged figure of one of which is given in the right hand lower corner of the Plate.

Eyes of very peculiar shape, lageniform, occupying the front of the lateral lobes, and produced upwards in a narrow neck round the part of the concave margin between the rostrum and the lateral lobes.

Upper Antennæ.—The third joint about equal in length to the first; the principal flagellum of seventeen joints; the secondary flagellum of six joints together equal to the first five of the principal.

Lower Antennæ.—The third joint a little upward bent; the fourth and fifth joints equal or nearly so; the flagellum of ten joints.

Mandibles.—On the left mandible there are twelve spines in the spine-row; the secondary plate of the right mandible has four clearly cut teeth followed by one or two denticles; the second joint of the palp has only two groups of spines near the outer margin; the third joint is as long as the second and distally a good deal broader, with spines singly or in groups at five points near the outer margin.

First Maxillæ.—The apex of the inner plate is still more narrowly produced than in the other species; the ten spines on the apex of the outer plate are as in that species.

Second Maxillæ.—The row of plumose setæ on the inner plate numbers twenty-six; the distal margin is flattened and more than half of it devoid of spines.

Maxillipeds.—On the outer plates the inner margin has six spine-teeth, the distal margin has six spines, of which the first is a strong spine-tooth, the three outermost are setiform, the other two of intermediate character; the first joint of the palp has slender spines on the outer apex; the second joint has a similar group, but no others on the outer margin; the third joint has surface spines at about the middle; the spine at the tip of the finger is a little shorter than the body of the finger.

First Gnathopods.—The side-plates are produced at the lower front corner and reach the base of the lower antennæ. The finger reaching beyond the palm.

Second Gnathopods.—The side-plates directed a little forwards. The branchial vesicles (not observed in the other species) very small and narrow. The marsupial plates much longer and broader than the branchial, gradually narrowing downwards, surrounded by long setæ. The first joint with only a few setæ on the convex hind margin; the hand oblong, but slightly narrowing towards the palm and with the front margin convex, the hind margin serrate, produced into a long tooth at the commencement of the palm, which is not very oblique, irregularly convex, and crenate; the much-curved finger reaches with the nail quite beyond the process which defines the palm; it has just within the inner margin a beaded appearance, seemingly caused by the presence of nine or ten minute spine-teeth which do not project beyond the margin.

Fourth Peræopods.—The first joint pear-shaped, with some spinules along the almost

smooth margins, a slender spine near the apex behind; the third joint longer than the fourth, these and the fifth and sixth being, as it were, reversed, the hind margin of the third and fourth nearly straight, each with strong spines at two points, the third with slender spines at two points in front, the fourth with spines at the apex of its convex front margin; the fifth with strong spines at four points of the straight hind margin and slender ones at four points of the convex front; the finger short, strongly bent, with a cilium at the base of the sharp nail.

Pleopods.—The pair examined resembling those of *Gammaropsis afra.*

Uropods and *Telson* in very close agreement with those of the species just named, yet not without minute differences, such as that the spines on the telson are not at the outer corners of the apical triangle, but further in upon the surface.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the extremity of the uropods, three-tenths of an inch.

Locality.—Off St. Vincent, Cape Verde Islands. One specimen, female.

Remark.—The specific name refers to the habitat.

Gammaropsis thomsoni, n. sp. (Pl. CXV.).

Rostrum scarcely perceptible, lateral lobes narrow, almost angular, with the lower margin long, convex at first; the postero-lateral angles of the third pleon-segment forming a little slightly upturned point, which does not project beyond the lower lobe of the hind margin; the corresponding points on the first and second segments are minute; the fourth segment has a small dorsal tooth in the centre of a postero-dorsal emargination, which is flanked by sharp points and has a seta or spine in each angle; the fifth segment has a similar emargination with the spines, but without the central tooth; the sixth segment is provided on either side of the telson with one or two short apical spines.

The Eyes are comparatively large, with numerous ocelli, closely fitted to the margin of the lateral lobes.

Upper Antennæ.—First joint rather long and thick, with some slightly feathered setæ on the lower margin and a spine at its apex; the remainder missing.

Lower Antennæ.—First and second joints short, gland-cone small, decurrent, acute at the tip; third joint longer than the preceding two united, with several spines, some of them long, setiform, and slightly feathered, on the lower margin and apex, and with two or three short spines on the upper margin. The remainder missing, but a detached joint, which probably is the fourth of the lower antennæ, is long, slightly curved, narrower at the base than elsewhere, and fringed with numerous spines, some of which are of great length.

Upper Lip.—The distal margin broad, furred, rather unsymmetrically insinuate.

Mandibles.—The cutting-edge divided into six or seven unequal teeth; the secondary plate on the left mandible divided into four or five teeth like those on the principal plate; on the right mandible the secondary plate is more ribbon-like, obliquely cut into four sharp teeth facing the principal plate, the lowest of the four much the longest; the spine-row is long, containing eleven or twelve long denticulate spines; the molar tubercle is very prominent, with finely dentate somewhat rounded crown; the palp is large, the first joint short, widest distally; the second joint of moderate length, carrying in front two rows of spines, many of which are very long; near the middle of the hind margin is a group of three, and a smaller group above, and another below, the middle; the third joint is as long as the second and distally wider; on the outer surface near the base are seven or eight long spines, and two others above them on the inner surface close to the outer margin; this margin is convex, interrupted a little before reaching the apex, and at that point shows a transverse group of several long, curved, slightly feathered spines; the apex itself is broad, fringed with similar spines, and there are many spines down much of the convex inner margin, but these spines are smaller than those at the apex.

Lower Lip.—The principal lobes distally broad, strongly ciliated along the inner margin, at the distal part of which there are two little spines; the oval inner plates are broad distally and strongly ciliated; the mandibular processes are very narrow and divergent.

First Maxillæ.—The inner plate with a sinuous inner margin, fringed with nine spaced setæ; the apex acute, tipped with a setule; the inner plate having ten spines on the distal margin; the innermost has a single lateral denticle low down; this is followed by three which have two lateral denticles on the outer side, the lower of the two exceedingly small, one spine is apically furcate; the remainder appear to have few denticles on the inner margin; the first joint of the palp is short, the second long, curved, widening a little from the base, having seven serrate spine-teeth on the distal margin, and about ten slender spines on the distal part of the inner margin and submarginal to the apex.

Second Maxillæ.—The inner plate shorter than the outer and a little less broad, with a row of twenty-six long plumose setæ passing from the base of the inner margin across the surface towards the outer apex; much of the inner margin fringed with spaced spines, and the front part of the rounded apex with close-set spines; the outer plate with many spines round the apex.

Maxillipeds.—The inner plates oblong, reaching beyond the first joint of the palp, with numerous plumose setæ on the inner margin, three spine-teeth and several feathered setæ or spines along the broad distal margins, which slope a little inwards near the inner angle; the outer plates not nearly reaching the end of the palp's second joint, the inner

margin carrying nine spine-teeth, the distal margin four longer spine-teeth and three or four setiform spines; the first joint of the palp very short, the second long, with slight spines at three points of the outer margin, and very many long ones along the inner margin and adjoining surface; the third joint longer than the first, widening distally, the distal half carrying numerous spines; the finger short, broad, with long apical spines instead of a nail, the principal spine longer than the body of the finger; the distal half of the finger's lower margin fringed with long slender spines; the dorsal cilium small, very near the hinge.

First Gnathopods.—Side-plates small, about as broad as deep, directed a little forwards. The first joint almost free of the side-plate, with some spinules along the slightly concave and pectinate front margin, and a slender spine and spinules at the apex of the convex hind margin; the second joint short, with a small group of spines at the middle of the hind margin and a group of several long ones near the apex; the third joint with spines on both margins, and on the inner surface, especially across the distal margin; the wrist longer than the hand, widening distally, the hinder margin fringed with many long spines, and the inner surface carrying many groups; the hand a little broader than the wrist, the hind margin, palm included, much more convex than the front, fringed with six groups of long spines; the inner surface carrying six groups of long spines in the neighbourhood of the front margin, and four or five smaller groups near the centre; the palm finely pectinate, set with some palmar spines and many spinules in addition to the groups of long spines; the finger broad, curved, the inner margin having about eight decurrent teeth, and fitting closely to the palm; the dorsal cilium small, near the base.

Second Gnathopods.—Side-plates small, much larger than the first pair, breadth and depth about equal, with some spinules along the lower and hinder margins. The branchial vesicles about as long as the first joint, and rather wider. The marsupial plates narrower than the branchial vesicles, a little longer, fringed with about forty setæ. The first joint nearly free from the side-plate, with spinules along the margins; the second and third joints less strongly spined than in the first pair; the wrist and hand together as long as the wrist and hand of the first gnathopods, but here the wrist smaller and shorter, the hand longer and larger; the wrist triangular, rather longer than broad, distally cup-like but not broadly, with spines at the apex of the front margin, three large groups along the serrate hind margin, and a still larger group about its apex and on the lower margin adjacent; the hand longer than broad, widening out from the wrist, the greatest breadth at the commencement of the palm, which is long, oblique, forming an obtuse angle with the hind margin, defined by four palmar spines, fringed with spinules and groups of long spines, and denticulate, two larger teeth rising amidst the smaller; besides some surface groups, there are spines at intervals along the convex front margin of the hand, and the serrate hind margin has nine or ten groups; the finger is strong

and curved, just reaching the end of the palm; the inner margin smooth, but forming a tooth just in front of the nail and bordered with a few small setules and tiny spine-teeth, neither series projecting beyond the edge; dorsal cilium as in the first gnathopods.

First Peræopods.—Side-plates, branchial vesicles, and marsupial plates rather larger than in the preceding segment, otherwise very similar. The first joint rather longer and broader than in the second gnathopods, showing closely-packed gland-cells; the second joint short, with spinules at two points of the hind margin and a small group of slight spines at its apex; the third joint broad, well-packed with gland-cells, widest distally, longer than the fourth joint, with spinules or spines at two points in front and three behind; the fourth joint not nearly twice as long as broad, with spines at four points of the hind margin and the apex of the front; the fifth joint longer than the third, with spines at six or seven points along the hind margin and two on the convex front margin, which like the preceding joint has also a spinule high up; the finger curved, more than half the length of the fifth joint, with an obvious aperture at the tip for the exudation from the gland.

Second Peræopods.—Side-plates, branchial vesicles, marsupial plates, and limb scarcely distinguishable from those of the preceding segment.

Third Peræopods.—Front lobe of the side-plates deeper than the hind one. Front joint not much dilated, broader above than below; the front margin only slightly convex, carrying small spines at intervals, and an apical group; the hind margin very faintly serrate and armed with spinules, and at the lower end a slender spine; the second joint with spines at two points of the front margin; the third joint not long, but longer than the fourth, with spines at two points of each margin, besides spinules at two points in front; the fourth joint with spinules at the centre and slender spines at the apex of the front margin and spines and spinules at the apex behind; the fifth joint longer than the third, with tolerably strong spines at four points in front and at two points behind; the finger strongly curved, half the length of the fifth joint, with a cilium at the base of the very acute nail.

Fourth Peræopods.—The front lobe of the side-plates a little deeper than the hinder, with some spinules in front; the hinder with a spine and spinule at the back. The limb similar in many respects to that of the preceding pair, but with the joints longer; the first joint with the hind margin concave below; the second with spines only at the apex; the third with spines at four points of each margin, the hinder being serrate and with strong spines; the fourth joint with two groups of strong spines in front, and a group at the apex behind, one of short, the next of slender, the lowest two of long and strong, spines; the finger is much less than half the length of the fifth joint.

Fifth Peræopods.—The side-plates small, not bilobed. The limb scarcely differing from that of the fourth peræopods; the first joint rather longer, with the hind margin

more concave; and the spines at the back of the fifth and perhaps at one or two other points rather stronger.

Pleopods.—Coupling spines small, slightly bent, the retroverted hooks including the apical being three on one side and two on the other; the cleft spines four on the first and second pairs, three on the third; but in the second pair one inner ramus had five cleft spines though its fellow had but four; the joints of the rami number from twelve to fourteen.

Uropods.—Peduncles of the first pair a little longer than the rami, with seven or eight spines along each of the upper margins and a very large curved spine at the lower apex; the inner ramus with a row of six spines on the upper margin and a group at the blunt apex; the outer ramus similar but shorter; the edges of both finely pectinate; peduncles of the second pair about as long as the outer ramus; the rami similar to those of the first pair, but a little shorter; peduncles of the third pair shorter than those of the second, but reaching beyond them, with three spines on the inner margin, and near the outer margin one on the surface and two at the apex; the rami equal in length to the peduncles, and one to the other, not reaching so far back as the outer ramus of the second pair, the edges obscurely pectinate, the inner ramus with four spines on the inner margin, two on the outer, and one at the apex, the outer ramus with three on the inner margin, one or two near the outer, and apparently a small group at the apex.

The Telson very little longer than broad at the base; the sides convex above, then converging to the broad distal margin which is a little convex in the centre and concave at either side, with a small fold of the integument running obliquely along the surface from either angle, the fold on either side carrying a small spine, which projects beyond the distal concavity (too faintly shown in the figure of the pleon).

Length.—The specimen in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, a quarter of an inch.

Locality.—Station 168, off New Zealand, July 8, 1874; lat. 40° 28′ S., long. 177° 43′ E.; depth, 1100 fathoms; bottom, blue mud; bottom temperature, 37°·2. One specimen, female.

Remarks.—The specific name is given in compliment to Mr. G. M. Thomson, rector of the High School, Christchurch, Dunedin, an accomplished carcinologist.

I have been unable to identify this species with any of the three, likewise from New Zealand, which my friend Mr. Chilton assigns to his genus *Paranænia*, nor can I perceive any very clear marks to distinguish that genus from *Gammaropsis*, of Liljeborg and Boeck.

Genus *Podoceropsis*, Boeck, 1860.

1860. *Podoceropsis*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 666.
1862. *Nænia*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 271.
1862. *Nœnia*, Bate and Westwood, Brit. Sess. Crust., vol. i. p. 471.
1869. *Nænia*, Norman, Last Report on Dredging among the Shetland Isles, p. 285.
1869. *Megamphopus* (?), Norman, Last Report on Dredging among the Shetland Isles, p. 282.
1870. *Xenoclea*, Boeck, Crust. amph. bor et arct., p. 154.
1870. *Podoceropsis*, Boeck, Crust. amph. bor. et arct., p. 162.
1871. *Nænia*, Metzger, Einundzwanzigster Jahresbericht Naturh. Ges. zu Hannover.
1876. *Xenoclea*, Boeck, De Skand. og Arkt. Amph., p. 561.
1876. *Podoceropsis*, Boeck, De Skand. og Arkt. Amph., p. 583.
1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 151.
1878. *Nænia*, Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 58.
1878. *Podoceropsis*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. ii. p. 367.
1879. *Nænia*, Stebbing, Trans. Devonshire Assoc., p. 520.
1882. *Podoceropsis*, Sars, Oversigt af Norges Crustaceer, p. 30.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 496.
1887. „ Bonnier, Catal. Crust. Malac. Concarneau, p. 108.
1887. „ Chevreux, Catal. Crust. Amph. Bretagne, p. 27.

For the original definition of the genus, see Note on Boeck, 1860 (p. 324); for the definition of *Nænia*, see Note on Spence Bate, 1862 (p. 336); for that of *Megamphopus*, which I only with hesitation make a synonym of the present genus, see Note on Norman, 1869 (in Appendix); for the definition of *Xenoclea*, see Note on Boeck, 1870 (p. 402). In 1876, as in 1870, Boeck defines it as follows, as third genus of the Photinæ :—

"*Upper Antennæ* with the third joint of the peduncle elongate; accessory flagellum wanting.

"*First Gnathopods* with the wrist elongate.

"*First* and *Second Peræopods* with the first joint very broad.

"*Third Uropods* biramous, the rami about equal to one another in length.

"*Telson* apically sinuate."

Of *Podoceropsis*, as sixth genus of the Microdeutopinæ, he gives the following definition :—

"*Upper Antennæ* with the third joint of the peduncle elongate; accessory flagellum wanting.

"*Second Gnathopods* larger than the *First*, and in the male much stronger than in the female.

"*First* and *Second Peræopods* with the finger small.

"*Third Uropods* with the rami equal to one another."

To *Podoceropsis* Boeck assigns the one species, *Podoceropsis sophiæ*, to which he makes *Nænia tuberculosa*, Spence Bate, a synonym; to *Xenoclea* he assigns the one species, *Xenoclea batei*, which is almost certainly the same as *Nænia rimapalmata*, Spence Bate. In *Nænia rimapalmata*, Spence Bate, in *Megamphopus cornutus*,

Norman, as in the new species *Podoceropsis kermadeci*, there is a rudiment of a secondary flagellum on the upper antennæ, and the presence of this might be noted among the generic characteristics; in the neighbouring genus *Gammaropsis*, the secondary flagellum is far from rudimentary.

Podoceropsis kermadeci, n. sp. (Pl. CXVI.).

Rostrum small, lateral lobes of the head acute, not very prominent; the head and peræon-segments hairy to a certain extent.

No *Eyes* perceived.

Upper Antennæ.—First joint elongate, with nine groups of slender spines on the lower margin, the longest at the apex, and five groups on or near the upper margin; the second joint thinner, a little longer, similarly furnished, but with the spines on the lower margin longer; the third joint thinner than the second, very little shorter than the first, with eight groups of long spines on the lower margin, four or five on the upper; the flagellum of six joints, together scarcely longer than the second of the peduncle, the first as long as the three following united, and with three groups of long spines and one of spinules on the lower margin, the fifth joint short, conical, and the sixth minute, all having long apical spines. There is a mere rudiment of a secondary flagellum, with two apical setules. Some of the long spines are distally very finely pectinate.

Lower Antennæ shorter than the upper, the first and second joints short, placed behind and below the lateral lobes of the head, the gland-cone small, but acute, decurrent; the third joint longer than the preceding two united, distally a little dilated, with spines along the lower margin and at the apex of the upper; the fourth joint elongate and furnished like the second of the upper antennæ; the fifth joint resembling the third of the upper antennæ; the flagellum of five joints, together scarcely longer than the fifth joint of the peduncle, the first joint carrying several long spines, its length exceeding that of the other four united, the last two and especially the last being very small, all carrying spines that are long, very slender, some pectinate.

Upper Lip.—The broad distal margin gently and almost symmetrically emarginate, faintly ciliated.

Mandibles very small compared with the length of the palp. The cutting edge divided into six unequal teeth, the three at the top and the lowest small, the other two rather large. The secondary plate on the left mandible rather broad, with an edge of five teeth, the lowest the largest; the secondary plate on the right mandible feebler, with two rather long and sharp teeth and some lateral denticles; in the spine-row there are on the left mandible three, on the right two, curved denticulate spines; the molar tubercle is very prominent, narrowed at the crown, of which the denticles are small and

sharp; there is a plumose seta on the side; in the right mandible the crown of the tubercle has two or three acute points independent of denticles; the first joint of the palp little longer than broad; the second long, bent forward at a little distance from the base, then straight, having three small spines standing out straight on the lower part of the front margin, and higher up several long pectinate spines on or near both margins; the third joint narrower and shorter, straight, with the hind margin slightly convex, the front margin and narrow apex carrying about twenty spines, most of them long, curved, and pectinate; the hind margin having quite near the base a very long and a shorter curved spine.

Lower Lip.—The rounded distal margins of the principal lobes not strongly ciliated, the inner lobes distally a little narrowed; the mandibular processes divergent.

First Maxillæ.—Inner plate small, oval, with three plumose setæ at intervals on the distal part of the inner margin, followed by two setules on the apex; the outer plate with probably ten slender spines on the rather broad truncate distal margin, several of which have five little lateral teeth, while three are distally furcate, in two the hinder branch the shorter; the first joint of the palp a little longer than broad; the second joint reaching much beyond the outer plates, undilated, the apical border armed with five spine-teeth, none of them broad, the outermost the longest; there are also some slender spines below the apical border and along the upper part of the inner margin.

Second Maxillæ.—The plates about equally broad, the inner the shorter, with many slender spines round the distal margin, and some setæ descending the inner margin for a little distance; the spines on the distal border of the outer plate longer, as usual, than those on the inner, with a few feathered spines on each side below the distal margin.

Maxillipeds.—The inner plates not quite reaching so far as the distal end of the palp's first joint, fringed with long plumose setæ on the upper part of the inner margin, which has a very small spine-tooth near the apex; the distal margin sloping slightly outwards, carrying two small spine-teeth and several slender spines; the outer plates not nearly reaching the end of the palp's second joint, the inner margin faintly serrate, unarmed (unless by spines on the adjacent surface) until near the apex when the margin is serrate for the insertion of three slender spine-teeth; on the distal margin there are three long curved setiform spines; the first joint of the palp is very short, the second long and narrow, with many spines along the inner and some along the outer margin; the third joint is longer than the first, expanded distally over the base of the finger, with many long spines about the apical part; the finger is short and broad and blunt, tipped with long spines instead of a nail, and having along the distal half of the inner margin six or seven spines of great length.

First Gnathopods.—The side-plates small and rhomboidal, the lower corner directed forwards but not reaching the base of the lower antennæ; it carries a single setule or

small spine, and the rounded hinder corner has three. The first joint is almost wholly clear of the side-plate, distally a little widened, the convex hind margin carrying on the lower part three serrate seta-like spines and some spinules; the second joint short, with an apical group of spines; the third joint with the front margin very convex, the hind margin serrate, carrying three groups of pectinate spines; there are two acute apices, between which more pectinate spines protrude from the inner surface; the wrist is as long and broad as the hand, the front margin with only an apical group of spines, the hind margin serrate, closely fringed with long spines pectinate on two edges, the inner surface also carrying several groups; the hand is dilated towards the palm, has four groups of spines along the serrate hind margin, and six groups along the convex front margin, besides scattered spines on the inner surface and groups near the palm-border; many or most of these spines are pectinate; the palm-border is almost at right angles with the hind margin, finely pectinate, slightly convex; the finger is curved, the inner margin smooth, with half-a-dozen minute submarginal setules, followed by two longer setules such as are commonly found at the base of the nail, the inner margin of the finger being here doubled, though there is no transverse mark to indicate the commencement of the nail; the termination is formed by a sharp spine, only half of which projects beyond the apex of the finger.

Second Gnathopods.—Side-plates broader than deep, with convex lower margin. First joint almost entirely free from the side-plate, much shorter and narrower than the hand, the hind margin convex, the front a little concave, with a group of spines a little above the apex, which projects beyond the short second joint, the third joint oblong, with some small spines at the apex of the straight hind margin; the wrist not nearly so broad as the hand, much broader than long, distally cup-like, with a group of spines at each apex, the short hind margin as well as the longer front one being otherwise smooth; the hand of great size, widest at the palm, where the width falls not far short of the length, the hind margin nearly straight, with some small groups of spines; the front margin on leaving the wrist very convex, afterwards straight and carrying some small groups of spines; the palm at right angles to the front and hind margins, much sculptured, beginning with the apical tooth of the hind margin, the interval between this and the following tooth being occupied by one or two small palmar-spines and a group of short slender spines; there is then a rather deep cavity with four or five spinules on its border, the remainder of the palm being convex, deeply serrate so as to form four rather distant teeth, the oblique intervals being set with several slender spines and spinules; the finger curves over the palm to its extremity and has a smoothly concave (perhaps in part microscopically spinulate) inner margin with submarginal setules, while the convex outer margin has at intervals five or six groups of small and slender spines besides a dorsal cilium near the base; the nail is not slender, but apically acute; there are some scattered spines singly or in small groups on the surface of the hand.

First Peræopods.—Side-plates rather smaller than the preceding pair. First joint reaching much below the side-plates, with a few small spines on the almost straight front margin, and at the apex of the hinder; the second joint short; the third longer than the fourth, not quite so long as the fifth, with two spinules and two groups of spines on the convex front margin, and two groups of spines on the straight hind margin; the fourth joint with three groups on the hind margin, the apical containing many spines; the fifth joint with spines at five points of the hind margin, and at the apex and a point near the middle of the convex front margin; the finger curved, half the length of the fifth joint, with a long dorsal feathered cilium near the base, a smaller cilium at the base of the nail, and on the inner margin, at a little distance from the nail, a spine with a flexible tip directed towards the nail.

Second Peræopods like the first, but rather shorter, the difference being chiefly in the length of the first joint; there is an additional spinule on the front margin of the fourth joint.

Length.—After the fourth segment of the peræon the specimen was defective; the existing portion, from the rostrum to the end of the fourth segment, measured one-fifth of an inch.

Locality.—Station 170A, north of the Kermadec Islands, July 14, 1874; lat. 29° 45′ S.; long. 178° 11′ W.; depth, 630 fathoms; bottom, volcanic mud; bottom temperature, 39°·5. A fragment only.

Remark.—The specific name refers to the place of capture.

Family Podoceridæ, Leach, 1814.

In 1814 Leach instituted the Podoceridæ as the fourth family of the Gammerides, assigning to it the genera, *Corophrium, Podocerus, Jassa.* In 1870 Boeck made the Amphithoinæ the twentieth [numbered as XIX] subfamily, and the Podocerinæ the twenty-first [numbered as XX] subfamily of the Gammaridæ; in 1872 to 1876, he made these two respectively the first and second subfamilies of the Podoceridæ, a family which he defines as follows:—

"*Mandibles* strong, apically much dentate; the secondary plate also dentate; the molar tubercle prominent; the spines of the spine-row numerous, often strong, serrate on the convex margin; the palp elongate, three-joïnted, often very strong.

"*Lower Lip* with the inner plate large.

"*First Maxillæ* with the inner plate little.

"*Second Maxillæ* with broad plates.

"*Maxillipeds* having the outer plates armed on the inner margin with strong teeth; the fourth joint of the palp not unguiform, but apically armed with two curved spines.

" Body compressed or subdepressed, with the back rounded.
" *Upper Antennæ* with the accessory flagellum short or absent.
" *First Gnathopods* smaller than the *Second*, with the hand subcheliform.
" *Second Gnathopods* with the hand subcheliform, sometimes cheliform.
" The *Fourth Peræopods* longer than the *Third*, the *Fifth* than the *Fourth*.
" *Third Uropods* uniramous or biramous.
" *Telson* thick."

To the Amphithoinæ Boeck assigned only the genera *Amphithoë* and *Sunamphithoë;* to the Podocerinæ *Podocerus*, *Janassa*, and *Cerapus*, of which *Janassa* is pretty certainly a synonym of *Podocerus*, and *Cerapus* not the true *Cerapus* but a synonym of *Ericthonius*, Milne-Edwards. In 1882, Sars, dropping the subfamilies, accepted the family Podoceridæ for the genera of both, naming them *Amphithoë*, *Sunamphithoë*, *Podocerus*, *Janassa*, *Erichthonius*.

For the original definition of the family Podoceridæ, see Note on Leach, 1814 (p. 86).

Genus *Amphithoë*,[1] Leach, 1813–1814.

1813. *Gammarus* (*Ampithöe*), Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 403.
1814. *Ampithöe*, Leach, Crustaceology, Appendix, Edinburgh Encyclopædia, p. 432.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii. p. 360.
1816. „ Leach, Annulosa, Encyclopædia Britannica, Supplement, p. 425.
1816. *Cymadusa*, Savigny, Mémoires sur les Animaux sans vertèbres, pt. i. p. 109.
1816. *Amphithoé*, Latreille, Nouveau Dict. d'hist. Nat., t. i.
1817. *Amphitoe*, Latreille, Le Règne Animal, t. iii.
1818. *Ampithoe*, Latreille, Tableau Encyclopédique, pl. cccxxxvi. fig. 33.
1818. *Ampithoë*, Leach, Crustacés, Dict. d. Sci. Nat., t. xii. p. 75.
1825. *Amphithoe*, Audouin, Descr. de l'Égypte, Explic. des Planches (pl. xi. figs. 4, 6).
1825. „ Desmarest, Consid. gén. sur la classe des Crustacés, p. 268.
1825. „ Latreille, Fam. Nat. du Règne Animal.
1829. *Ampithoe*, Latreille, Le Règne Animal, t. iv.
1830. *Amphithoe*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. (extract, p. 24).
1832. *Amphithoë*, Zenker, De Gammari Pulicis Fabr. Hist. Nat., p. 1.
1836.[2] *Amphitoe*, Guérin-Méneville, Iconographie du Règne Animal, t. ii. iii. pl. xxvi. fig. 9.
1837. *Amphithoë*, Burmeister, Handbuch der Naturgeschichte.
1837. „ Rathke, Beitrag zur Fauna der Krym, Mém. Acad. Imp. St. Petersbourg, tom. iii. p. 379.
1838. *Amphitoé*, Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, tom. v.
1840. *Amphithoe*, Lucas, Hist. Nat. des Crust. Arachn. et Myriap., p. 229.

[1] Since the very general acceptance of the form *Amphithoë*, I have considered that it would be inconvenient and pedantic to revert to the oddly spelt form *Ampithöe*, which Leach adopted at the first suggestion of the genus in 1813, and continued to use in his later writings.

[2] If the genus *Sunamphithoë*, Spence Bate, should be united to *Amphithoë*, as being separated by only one mark of distinction of doubtful generic value, *Anisopus*, Templeton, 1836, would then have to be included in the synonymy of *Amphithoë*.

1840. *Amphitoe*, Milne-Edwards, Hist. Nat. des Crustacés, tom. iii. p. 28.
1843. *Amphithoe*, Rathke, Beiträge zur Fauna Norwegens, p. 79.
1845. *Amphitöe*, Goodsir, Ann. and Mag. Nat. Hist., vol. xv. p. 75.
1845. *Amphithoe*, Krøyer, Naturh. Tidsskr. R. 2, Bd. i. p. 335.
1846. „ Krøyer, Naturh. Tidsskr. R. 2, Bd. ii. p. 67.
1847. *Amphithoë*, W. Thompson, Ann. and Mag. Nat. Hist., vol. xx.
1849. *Ampithoe*, Milne-Edwards, Le Règne Animal, Illustrated Edition.
1849. *Amphithöe*, Dana, Synopsis Gen. Gamm. Amer. Journ. Sci. and Arts, ser. 2, vol. viii.
1849. *Amphithoe*, Lucas, Explor. scientifique de l'Algérie, Zool., p. 54.
1850. „ White, List of British Animals in Brit. Mus., p. 50.
1852. *Amphitoë*, Dana, Proc. Amer. Acad. Arts and Sci., vol. ii.
1852. *Amphithoe*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. xli.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 910, 935.
1853. „ Costa, Rend. della Soc. r. Borb.
1854. „ Stimpson, Marine Invertebrata of Grand Manan, p. 53.
1855. „ Stimpson, Proc. Acad. Nat. Sci. Philad., vol. vii.
1857. *Pleonexes*,[1] Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 15 (sep. copy).
1857. *Amphitoë*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 15 (sep. copy).
1857. *Amphithoe*, Costa, Ricerche sui Crost. Amf. Nap., pp. 174, 200.
1857. *Pleonexes*,[1] White, Popular History of British Crustacea, p. 199.
1857. *Amphithoe*, White, Popular History of British Crustacea, p. 200.
1858. *Amphitoë*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. i. p. 362.
1859. *Amphithoe*, Bruzelius, Skand. Amph. Gamm., p. 30.
1860. *Amphithoë*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 668.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 233.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 416.
1864. „ Stimpson, Proc. Acad. Nat. Sci. Philad., June, 1864.
1866. „ Heller, Beiträge zur näheren Kenntniss der Amph. des Adriat. Meeres, p. 43.
1868. „ Czerniavski, Materialia ad zoographiam ponticam comparatam, p. 101.
1870. „ Boeck, Crust. amph. bor. et arct., p. 163 (243).
1872. „ Boeck, Bidrag til Californiens Amphipodefauna, p. 42.
1874. „ M'Intosh, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv.
1874. „ S. I. Smith, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv. p. 240.
1874. „ S. I. Smith, Invertebrate Animals of Vineyard Sound, p. 563 (269).
1874. „ Stebbing, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv. p. 112.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 587.
1876. *Amphithoe*, Catta, Ann. d. Sci. Nat., ser. 6, t. iii. p. 27.
1877. *Amphithoë*, Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 153.
1877. *Amphithoe*, Stalio, Catalogo dei Crost. dell' Adriatico, p. 169.
1878. *Amphitoe*, Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 56.
1880. *Amphithoë*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. pp. 269, 337.
1880. „ Kossmann, Zool. Ergebnisse des rothen Meeres, p. 134.
1880. „ Nebeski, Beiträge zur Kenntniss der Amph. der Adria, pp. 7, 38.
1882. „ Haswell, Catal. Australian Crustacea, p. 266.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 31.

[1] *Pleonexes* is probably a synonym of *Sunamphitoë*, which White spells as *Synamphithoe*, and if that genus be retained as distinct from *Amphithoë*, *Pleonexes* had a kind of claim to priority, being placed in front of *Sunamphitoe* both in 1856 when the two genera are first mentioned, and in 1857 when they are first defined.

1884. *Amphithoë*, Blanc, Die Amph. der Kieler Bucht, pp. 51, 77.
1885. *Amphithoe*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 395.
1886. *Amphithoë*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 496.
1887. *Amphitoe*, Bonnier, Catal. Crust. Malac. Concarneau, p. 108.
1887. *Amphithoe*, Chevreux, Catal. Crust. Amph. Bretagne, p. 27.

For the original definition of the genus, see Note on Leach, 1814 (p. 86). *Cymadusa*, Savigny, was never defined, and has been identified by the figures. For the definition of *Pleonexes* (and for that of *Sunamphitoë*), see Note on Spence Bate, 1857 (p. 294). Boeck's definition of the genus is practically included in that which he gives for his subfamily Amphithoinæ, from which I omit what has been already given in the character of the family.

"*Lower Lip* with the outer lobes deeply incised at the apex; the inner lobes large.

"Body compressed; side-plates of moderate size, not plumose on the lower[1] margin; fifth pair as deep as the fourth and broader, incised on the hinder margin for the retroverted third peræopods.

"*Upper Antennæ* slender; third joint of the peduncle very short; flagellum long; accessory flagellum absent.[2]

"*Lower Antennæ* with very short flagellum.

"*First* and *Second Gnathopods* with subcheliform hand; the hand of the first pair of the same shape as that of the second; the second pair stronger in the male than in the female.

"*Third Peræopods* retroverted.

"*Uropods* biramous; third pair with the rami little; the outer ramus furnished with two hooks (ungvibus)."

For the genus itself he says:—

"*Mandibles* with the third joint of the palp not very dilated, almost equalling the length of the second joint.

"*First* and *Second Gnathopods* with the finger dentate; the second pair stronger than the first."

It may be observed that it is only the four terminal joints of the third peræopods that are retroverted, and that the third joint of the mandibular palp sometimes even exceeds the second in length. For the generic character of *Sunamphithoë*, Boeck says, "Last three pairs of peræopods with the last [meaning the fifth, not the sixth] joint dilated downwards and constituting a subcheliform hand; other points almost as in *Amphithoe*."

[1] *Interiore* is no doubt a misprint, copied from the earlier of Boeck's works into the later, *inferiore* being intended as in the account of the Leptocheirinæ and Photinæ.

[2] It is this character which separates *Amphithoë* from *Grubia*, Czerniavski, and *Amphithoides*, Kossmann.

Amphithoë kergueleni, n. sp. (Pl. CXVII.).

Rostrum inconspicuous, lateral lobes of the head not very prominent, with rather irregular outline; the postero-lateral angles of the first three pleon-segments almost squared. The animal in many parts covered with dark stellate markings.

Eyes rounded oval, situated on the lateral lobes of the head close to the margin.

Upper Antennæ.—First joint rather thick, about as long as the head, with some spinules on the under margin, and at the apex a group of small stiff spines and longer slender ones; the second joint much narrower but longer than the first, slightly bent, with spinules along the margins, and some slender spines on the lower one; the third joint more than a third the length of the second, similarly armed; the flagellum much longer than the peduncle, with thirty-three slender joints, tipped with setiform spines, alternately longer and shorter on the upper joints.

Lower Antennæ shorter than the upper. First two joints very short, gland-cone small, acute, decurrent; third joint short and broad, longer than the preceding two united, with some spinules on the margin, and a large group of setiform spines on the lower apex; the fourth joint abruptly narrower, about as long as the first joint of the upper antennæ, slightly bent, with setiform spines at four or five points of each margin; the fifth joint similar, a little shorter and narrower; the flagellum of twenty joints equipped as in the upper antennæ, and the last joint being, as in that pair, minute.

Upper Lip.—The centre of the distal margin rounded, prominent, the cilia there being straight, spine-like, projecting; the cilia on either side long, directed towards the centre; the margins between the rounded sides and rounded centre of the plate being nearly straight.

Mandibles.—The cutting edge divided into eight strong teeth; the secondary plate into five or six on the left mandible, and on the right mandible into four that are alternately long and short; the spine-row consisting of nine long bent spines, denticulate prominently on the outer convex side; the inner spines longer than the outer; the molar tubercle prominent, with long teeth round the crown of it, and a long plumose seta, two of the teeth by its side on the right mandible being almost setiform in their length; there is a process near the base of the palp; the first joint of the palp rather longer than broad; the second joint not very long, with spines at three points of its front margin; the third joint rather longer and broader than the second, with about fourteen long pectinate spines, of which four or five may be reckoned to the front margin, the rest are crowded round the apical curve, those at the extreme apex being the longest; the outer margin is a little convex, without spines.

Lower Lip.—The principal lobes narrow, finely ciliated on the outer margins, with a little conical process at the inner apex, the inner margin deeply sinuous, ciliated on the

upper and lower prominences, strongly on the lower; the inner lobes narrowed below, strongly furred above; the mandibular processes divergent, apically rounded.

First Maxillæ.—The inner plate having the inner margin fringed with many slender plumose setæ; the outer plate with ten spines on the distal margin, of which two have a single tooth on the outer side, one a single tooth on the inner side, the rest having from two to five denticles apiece, except one of the outermost, which is apparently without teeth; the second joint of the palp of nearly equal breadth throughout, curved, with nine spine-teeth round the curve of the apical margin, most of these being pectinate on the outer margin; there are on one maxilla six, on the other seven, setiform spines passing across the surface from the inner margin towards the outer apex.

Second Maxillæ.—The inner plate a little shorter and much narrower than the outer, with a long row of three and twenty plumose setæ passing from near the base in a gentle curve towards the outer apex; there are also spines along the slightly serrate nearly straight inner margin and many on the narrow apex; on the outer plate a row of sixteen or seventeen long spines singly or in pairs, beginning on the upper half of the straight inner margin, passes towards the apex, keeping near the margin; about as many more encircle the broadly rounded apex and its outer slope; this plate is narrower at the base than above, the reverse being the case with the inner plate.

Maxillipeds.—The inner plates reaching just beyond the first joint of the palp, with many plumose setæ along the inner margin, and several feathered spines along the distal margin and a spine-tooth at the inner apex; the outer plates rather narrow, not quite reaching the apex of the second joint of the palp, with sixteen serrate spine-teeth (graduated in size) on the inner margin, three on the apical, followed by nine long setiform spines which reach a long way down the hind margin, all the spine-bearing margins being serrate; the first joint of the palp short; the second long, well fringed on the inner margin with long spines; the third joint a little longer than the first, widening distally, both margins and the apex being set about with spines, two at the apex being strongly pectinate; the finger, including the ungual spine, is nearly as long as the third joint, its inner margin nearly straight, with two rows of pectination; the spine which does duty for a nail is also pectinate, shorter than the trunk of the finger, and is accompanied by another spine and a spinule near the base on the inner margin of the finger.

First Gnathopods.—The side-plates much wider below than above, the lower front corner being strongly produced towards the base of the lower antennæ; there are several setæ on the lower margin, chiefly on the hinder part; the integument is marked with little dots, which are bright when seen by transmitted light; these, however, are not confined to the side-plates. The first joint reaching beyond the side-plate, carrying a few setiform spines at different points of both margins; the second joint short, with some slender spines at the apex behind; the third joint broader above than below, the hind margin straight, carrying several spines, especially on the serrate part

near the slightly produced apex ; the free part of the hind margin is curved and forms an angle with the oblique portion which lies against the wrist and is apically acute ; the distal margin is concave between the two apices ; the wrist is elongate, almost as long as the hand, the hind margin serrate, bordered by a row of about fifteen spines ; it has also some spines upon the surface and at the apex of the long front margin ; the hand widens slightly towards the obliquely curved palm ; it has near the slightly convex front margin four large groups of spines ; on the straight hind margin there are five groups of slender spines, followed by a large palmar spine and then by another group of slender spines ; the finely pectinate palm joins the hind margin by a smooth curve, and is bordered by many submarginal spines of various lengths ; the finger is broad, slightly curved, with a very small cilium near the base ; its inner margin is cut into fourteen teeth, and there are one or two setules at the base of the nail, which projects considerably beyond the palm.

Second Gnathopods.—The side-plates deeper than in the preceding pair, but not so broad, of nearly even width throughout, the front margin convex, the lower also convex, fringed with setæ. The first joint reaching beyond the side-plate, with some setæ on the upper part of the convex hind margin, the front margin concave till near the distal part which forms a projecting round lobe carrying a spine and spinule ; the second joint is short, with the front margin very convex, the hind margin only slightly convex, carrying one or two spinules and at the apex a group of slender spines ; the third joint is more regularly oblong than in the preceding pair, with many spines about the distal margin, and a group a little way above the apex of the hind margin ; the wrist is triangular, a good deal shorter than the hand, distally cup-like, with spines at five points of the slightly convex front margin, and a bush of spines about the rounded apical portion of the hind margin. The hand is broad, with six or seven groups of spines along the slightly convex front margin and others near it ; the hind margin is also slightly convex, with seven groups of slender spines ; it forms a rounded angle with the oblique very sinuous palm, which is set with numerous slender spines of different lengths, and over which the broad curved finger closes, so as to reach the angle with its tip, the dentate inner margin leaving a small cavity between itself and the concave commencement of the palm ; the palmar spine is set rather deeply on the surface and projects beyond the palmar angle.

First Peræopods.—Side-plates rather broader and deeper than the preceding pair. Branchial vesicles as long as the side-plates, but much narrower. Marsupial plates long and narrow, surrounded by very numerous setæ, the surface appearing as if striped with lines of tubercles, the appearance perhaps due to the internal vessels. The first joint reaching a little beyond the side-plate, packed with gland-cells, carrying some setæ or setiform spines and spinules at various points of both margins, but especially on the hinder ; the second joint rather longer than broad, with some slender spines at the apex

behind ; the third joint widening distally, rather longer than the fourth, scarcely so long as the fifth, with slender spines at several points of the hind and two or three of the front margin ; the fourth joint has many slender spines along the nearly straight hind margin, on the more convex front a spinule high up and a small apical group ; the fifth joint with seven or eight sets of slender spines on the hind margin, a spinule high up on the convex front margin, a group of slender spines below the spinule and another at the apex; the finger short, not half the length of the fifth joint, with a dorsal cilium near the base, and an opening on the inner side of the apex.

Second Peræopods.—The side-plates rather broader than in the preceding pair; the branchial vesicles and marsupial plates similar; the limb also similar, with the fifth joint slightly shorter and having rather fewer spines.

Third Peræopods.—The side-plates with the front lobe about as large as the preceding plates, having some setæ on the hinder part of the lower margin, the hind margin convex; the hind lobe shallow, with two setæ at the hind corner and the hind margin rounded. The limb short, easily detached; the first joint much smaller than the side-plate, widest above, the length and breadth equal, the front margin convex, with a short thick spine near the top, and four or five rows of slender spines at intervals; the hind margin very convex at the upper part, with some spinules at the apex, otherwise almost unarmed; the second joint with a slender spine and some spinules at the apex in front; the third joint scarcely longer than the fourth, shorter than the fifth, with some slender spines and spinules at the centre of the convex front margin, a group at its apex, and somewhat stouter spines at two points of the hind margin; the fourth joint is equipped like the third, both with the two following joints having, as is usual in this genus, the true hind margin in front; the fifth joint having a spinule high up on the convex front margin, followed by three groups of slender spines; on the serrate hind margin there are large stout spines at four points, accompanied by setæ; at the distal end in the cavity which it forms with the very short extremely upward bent finger there are some small stout spines; the finger is sharp at the tip, and has a strongly feathered dorsal cilium at the base.

Fourth Peræopods.—Side-plates shallow, the front lobe a little deeper than the hind one. Branchial vesicles not as long or as wide as the first joint. The first joint longer but narrower than in the preceding pair, the front margin evenly convex, with a spinule here and there, the hind margin convex at the upper part, almost unarmed, the lower part a little concave, with one or two small spines; the second joint short; the third longer than the fourth, shorter than the fifth, with slender spines at two points of each margin; the fourth joint similarly armed, but with an additional spinule high up on the hind margin; the fifth joint with slender spines at three points of the hind margin and four of the front, there being likewise some stouter spines at the apex in front; the finger short, curved, less than half the length of the fifth joint, with a feathered dorsal cilium.

Fifth Peræopods.—Side-plates smaller than in the preceding segment. The limb scarcely differing from that of the fourth peræopods, but rather longer, especially with respect to the first joint.

Pleopods.—Coupling spines thin, with broad much-bent apices; cleft spines four in number on the first two pairs, three on the third pair; the joints of the rami numbering from fifteen to nineteen, the outer ramus rather shorter than the inner and curved.

Uropods.—The peduncles of the first pair longer than the rami, with the usual curved spine at the lower apex; the outer ramus shorter than the inner, with four spines on the outer margin, three at the upper part of the inner, and a group of five at the truncate apex; the inner ramus with three spines on the outer, six on the inner margin, and the apical group; the peduncles of the second pair reaching a little beyond those of the first, not quite so long as the inner ramus, which has five spines on the inner margin, three on the outer, and the apex as in the preceding pair; the outer ramus a little shorter, with four spines on the outer margin, three on the inner and the apical group; the peduncles of the third pair longer than the rami, reaching much beyond the other peduncles, having on the apical margin four little stout spines and three or four that are setiform; the outer ramus having on the straight outer margin a stout spine, and at the broad apex two strong much-curved spines, the outer the broader, the inner the longer; the oval inner ramus has a spine near the middle of the inner margin, and about the apex four short stout spines and a row of nine setiform spines of different lengths.

The Telson is small, broader than long, much wider above than below, not nearly reaching the end of the peduncles of the third uropods, the distal margin nearly straight between the two acute corners, each of which carries a cilium; on the surface a little way from each apex is a long seta or setiform spine, and there are two setæ on each lateral margin near the centre.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, rather over one-fifth of an inch.

Locality.—The single specimen, a female, was obtained at Kerguelen Island, whence the specific name.

Amphithoë flindersi, n. sp. (Pl. CXVIII.).

Rostrum inconspicuous, lateral lobes of the head little prominent; the postero-lateral angle of the first three pleon-segments more or less rounded, but with a little notch where the curve of the hind margin meets that of the lower margin; the fourth segment with a transverse dorsal depression.

The Eyes oval, small, with many small ocelli, the position rather horizontal than vertical.

Upper Antennæ.—The first joint rather thick, more than twice as long as broad,

not so long as the head, with some small slender spines about the distal end. The remaining joints missing. Fig. *a.i.* should be *a.s.*

Lower Antennæ.—The first two joints short, the gland-cone decurrent, the third joint not as long as the preceding two united, having three or four small groups of spines about its distal end. The rest of the joints missing. Both figures *a.s.* should be *a.i.*

Mandibles.—The cutting edge broad, with seven well-defined but unequal teeth on each mandible; the secondary plate on the left mandible with the broad distal edge cut into five teeth; on the right mandible this plate has two obvious teeth, with perhaps two or three denticles in addition, and as usual does not easily lend itself to a broadside view, except when seen through the transparent skin in preparation for the next moult; the spines of the spine-row are six in number, slender, much bent, and the distal half strongly denticulate especially on the front convex side; on the right mandible the sixth spine is diminutive; the molar tubercle prominent, with long teeth encircling the crown, and a long plumose seta at one corner of it. The process near the base of the palp is small; the first joint of the palp a good deal longer than broad; the second joint about twice as long as the first, with a spinule near the apex; the third about as long and broad as the second, with five long spines on the broad apex. The right mandible is figured on the left, and the left mandible on the right, in the Plate; the large uppermost tooth of the cutting edge has beside it a less prominent tooth not shown in the figures.

Lower Lip.—The principal lobes distally narrow, with the inner corner produced in a little rounded point, the inner margin strongly sinuous, with cilia on the slightly convex distal part and on the very convex lower part, which is near the strongly ciliated distal margin of the inner lobes; the mandibular processes are large, distally narrow but not acute.

First Maxillæ.—The inner plate small, in one maxilla with two, in the other with three, plumose setæ on the inner margin; the outer plate broad, with ten spines on the broad truncate distal margin, the innermost with three lateral denticles, two of the three next with a single lateral tooth on the outer side, some but not all of the others having, as far as could be seen, two or three lateral teeth on the inner side; the first joint of the palp very short, the second widening from the base, curving, and reaching a little beyond the outer plate, its apical margin with sloping sides cut into four teeth and carrying five spine-teeth; there are three slender spines on the surface at some distance from the apical as well as from the outer and inner margins.

Second Maxillæ.—The inner plate nearly as long but not so broad as the outer, with a series of thirteen setæ passing from near the base of the inner margin in a curve towards the outer apex; the apical margin is narrow, with a group of close-set spines, and a few descend the distal part of the inner margin at intervals; the outer plate has a straight inner margin, at the upper part of which is a series of four spines, there

are three that are subapical, ten on the inner apical corner, close-set, and two more spaced on the outward sloping part of the distal margin.

Maxillipeds.—The inner plates reach a little beyond the first joint of the palp; they have seven plumose setæ along the inner margin, three or four on the surface adjacent; and a spine-tooth just below the apex; the distal margins slope a little outwards and carry five or six feathered spines, but not more, so far as I could see, than one spine-tooth; the outer plates reach beyond the second joint of the palp, and have on the crenate and finely pectinate inner margin eight spine-teeth, two more on the distal margin, followed by three setiform spines on the outer curve; the first joint of the palp is short, with a small spine on the outer margin a little below the rounded apex; the second joint is not twice as long as the first, its inner margin is fringed with not numerous spines; the third joint is not longer than the first, with some spines along the front margin, and a group of five at the outer apex, of which two are conspicuously pectinate for part of their length; the finger is almost as long as the third joint, if the ungual spine or nail be included; there is a minute dorsal cilium near the base, and on the inner margin near the origin of the nail, which is pectinate on the inner side, there are two setules, one shorter, the other longer than the nail.

First Gnathopods.—Side-plates almost triangular, the rounded front corner being strongly produced forwards towards the base of the lower antennæ. The first joint reaching a little distance below the side-plate, with three long setæ on the upper part of the convex hind margin, and a few others on the surface; the front margin tending to concave; the second joint short; the third with a very short front margin, the hind margin convex, with a spinule below the middle, and a slender spine near the apex; the wrist not quite so long as the hand, but as broad, the convex front margin smooth, the hind margin also smooth, furnished with half a dozen slender slightly feathered spines, the surface having three or four more; the hand widens from the base to the palm; the long front margin is very slightly convex, with three or four small groups of spines at or near it; the hind margin is also but slightly convex, at first smooth, but near the palm carrying three little groups of spines followed by a palmar spine, where with a smooth curve it passes into the oblique palm border, which is set with several submarginal slender spines of different sizes; the finger is short, stout, and curved, with a small dorsal cilium near the base; the inner margin is at first finely pectinate, then cut into five teeth of gradually increasing size; there is one small setule near the first of these, and three near the last, which is followed by the sharp curved nail.

Second Gnathopods smaller than the first. Side-plates narrower but rather deeper than the preceding pair, with a long seta at the hind corner of the convex lower margin. The branchial vesicle much shorter and narrower than the side-plates. The first joint is armed with long setæ as in the first pair; it does not reach so far beyond the side-plate, that being deeper; the third joint with the front margin straight, almost wholly applied

against the wrist, apically pointed, the hind margin distally rounded, distal margin distinct, set with spines; the wrist scarcely longer than the third joint, triangular, distally a little cup-like, with eight or nine geniculate spines on the lobe which is constituted by the hind margin; there are one or two small spines on the apex of the front margin, and one or two spines or setæ on the surface; the hand is longer than the wrist, and at the palm a little broader; there are spines at three points near the smoothly convex front margin, and a group at its apex; the hind margin is slightly convex, smooth, with one spine and three pairs of spines submarginal along the distal half; these are followed by a palmar spine, where the hind margin joins the palm by a curve; the palm itself has a minutely pectinate edge, and is bordered but not thickly by several slender spines of various lengths; the finger is short, in structure corresponding with that of the first gnathopods; there are two small spines on the surface of the hand. The gnathopod on one side with fewer spines and with a smaller hand and finger than on the other, probably abnormal.

First Peræopods.—The side-plates broader than the preceding pair; with two setæ on the lower margin near the hind corner. The branchial vesicles larger than in the preceding segment. The first joint reaching a little beyond the side-plate, broader at the upper part than the lower, packed with gland-cells, with some long setæ or setiform spines at intervals along the hind margin and a few on the surface at the upper part; the second joint short, with a slender spine and spinules at the apex behind; the third joint similarly armed at each apex, and with a slender spine higher up on the hind margin; this joint widens distally, is longer than the fourth, not longer than the fifth, none of the joints being elongate; the fourth has slender spines at three points of the hind margin and at the apex in front; the fifth joint has a group at either apex, and a single slender spine above the centre on the convex front margin, and one below the centre on the straight hind margin; the finger is short and broad, curved, longer than half the fifth joint, with a dorsal cilium near the base, and an opening within the blunt apex.

Second Peræopods similar to the first.

Third Peræopods.—Side-plates broader than the preceding, but not quite so deep, the front lobe very large, the hind lobe shallow. The branchial vesicles smaller than in the preceding segment. The limb missing.

Fourth and Fifth Peræopods.—The side-plates small. The limbs missing.

Pleopods.—Coupling spines small, with only the apical pair of hooks; cleft spines two in number; the joints of the rami numbering from eight to nine, the outer ramus being a little shorter than the inner.

Uropods.—The peduncles of the first pair very little longer than the inner ramus, with three spines on each of the upper margins, and a large spine at the lower apex; the outer ramus the shorter, with two lateral spines and an apical group of four or five spines,

one of which is large and a little denticulate; the inner ramus is similarly armed; the peduncles of the second pair as long as the inner ramus, with a spine at the apex of each of the upper margins; the outer ramus shorter than the inner, with a spine on each margin and an apical group as in the preceding pair; the inner ramus with three spines on one margin, one on the other, and the apical group; the peduncles of the third pair longer than the rami, reaching much beyond the peduncles of the preceding pairs, having four small spines and a couple of setæ on the distal margin; the rami very short, the outer with a slender spine just below the middle of the outer margin and two short hooked spines at the rounded apex, the outer spine the stouter; the inner ramus oval, slightly longer than the outer, with a spine near the middle of the inner margin, and at the apex two short spines and a long and a short slender spine.

The Telson of about equal length and breadth, much rounded, not reaching nearly so far as the peduncles of the third uropods, with a pair of setæ or setiform spines on the surface, one on either side the centre of the telson, another pair lower down but some way above the distal margin, each of the latter pair being attended by a setule; there is also a cilium or setule at the upturned corner on each side of the distal margin, and perhaps some small cilia elsewhere.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the uropods, three-twentieths of an inch.

Locality.—Station 186, Flinders Passage, September 8, 1874; lat. 10° 30′ S., long. 142° 18′ E.; depth, 8 fathoms; bottom, coral mud. One specimen.

Remark.—The specific name refers to the place of capture. There is a great similarity between this species and *Amphithoe brevipes* as figured and described by Dana, but the two species do not seem to agree in respect to the uropods and telson. *Amphithoe brevipes* was also taken in a very different climate, "near Hermite Island, Tierra del Fuego; brought up with kelp in 5 fathoms water." With *Amphithoe brevipes*, Dana, *Amphithoë falklandi*, Spence Bate, seems to be in close agreement, since in the description of the upper antennæ of the latter species, "third joint of the peduncle longer than the preceding," third is probably only a misprint for second.

Amphithoë japonica, n. sp. (Pl. CXXXVIII. A).

In general appearance this species is in close agreement with *Amphithoë rubricata*, Montagu.

Rostrum obsolete, lateral lobes of the head not strongly advanced, the sides of the head excavate below the lateral lobes for the base of the lower antennæ; the postero-lateral angles of the first three pleon-segments with produced points, not upturned and scarcely acute.

The Eyes small, irregularly round, situate on the lateral lobes of the head.

Upper Antennæ.—The first joint about as long as the head, with a short stiff spine at the lower apex, and slender spines there and elsewhere; the second joint longer and much thinner, with several groups of slender spines and spinules; the third joint about one-third the length of the second, similarly curved; the flagellum much longer than the peduncle, having (on one of the specimens) forty-six joints, very slender towards the distal end of the flagellum. There is on the distal end of the third joint of the peduncle a little setuliferous (seemingly jointed) tubercle, that may be regarded as a remnant of a secondary flagellum. This, however, is not so long as what Czerniavski figures, in 1868, for the secondary flagellum of *Grubia taurica* and describes as *minutissimo.* In *Amphithoides longicornis*, Kossmann, 1880, the secondary flagellum though not as long as the first joint of the primary, consists of a long and a short joint.

Lower Antennæ.—The first two joints very short, closely coalesced, the gland-cone decurrent; the third joint short, but longer than the coalesced first and second, carrying some slender spines of various lengths; the fourth joint much thinner and longer than the third, rather longer than the second of the upper antennæ, carrying several slender spines; the fifth joint thinner and a little shorter, similarly furnished; the flagellum of about five and twenty joints, together longer than the fourth and fifth of the peduncle united, the terminal joints long and slender.

Upper Lip rather broad, the distal margin not quite evenly convex, since the broad central part projects slightly, this part being strongly furred all round.

Mandibles.—The cutting edge divided into seven or eight teeth; the secondary plate with four teeth on the right mandible, and five on the left; the spine-row consisting of nine very slender spines, curved and denticulate; the molar tubercle strong, with sharp slender teeth round part of the crown, broad teeth or transverse plates on the side, and at one corner a slender spine; the first joint of the palp not quite twice as long as broad, the second about twice the length of the first, widening a little distally, with some spines at the apex in front; the third joint rather longer and broader than the second, widening a little distally, and on the convex sloping apical border carrying about twenty long denticulate spines, the longest on the apex of the hind margin; there are also one or two spines on the surface very near the apex of the front margin, which is shorter than the hinder one.

Lower Lip.—The principal lobes dehiscent, strongly ciliated on the inner margin, at the top of which there is a wide and deep emargination, by which a narrow distal lobe is formed, directed inwards, the outer or distal border smooth, but the sinuous inner border ciliated; the inner lobes are long, much wider at the oval distal part, which is very strongly ciliated, than at the squared base; the mandibular processes large, divergent, with the outer margin very convex.

First Maxillæ.—The inner plate small, widening from a narrow base, the inner

margin straight, with a slender spine standing out stiffly from about the middle, the outer margin very convex, and the distal slightly so; the outer plate broad, curved, the distal margin carrying ten spines, the innermost and two or three others with two or three small lateral denticles, two that are near to the innermost more slender than the rest, and having each a minute denticle on the outer side, and in one of the maxillæ having another little denticle on the inner side; the outermost two or three stouter than the rest and seemingly smooth; the first joint of the palp short, yet longer than broad; the second joint reaching beyond the outer plate, and having six slender spine-teeth along the distal half of the inner margin, three on the apical, and some slender spines crossing the surface.

Maxillipeds.—The inner plates not reaching the distal end of the palp's first joint, long and narrow, tending to oval, the inner margin set with about two dozen long plumose setæ, one, two, or three together; the distal margin narrowly rounded, set with several feathered setiform spines, but seemingly without spine-teeth; the outer plates large, reaching beyond the second joint of the palp, with fourteen spine-teeth, not close-set, on the serrate inner margin, two larger ones on the distal margin, and seven long spines passing far down the serrate convex outer margin; there are dark stellate markings on this plate; the first joint of the palp is not very long, with two or three spines on the short inner margin; the second joint is not twice as long as the first, widening distally, with spines on the inner margin, which are numerous round the apical part; the third joint subequal in length to the first, with four groups of spines on or near the hind margin, some of them strongly pectinate; the convex inner margin fringed for the distal two-thirds with slender spines, the apical pectinate coarsely for part of their length and finely for the remainder; the finger short and narrow, having the inner surface thickly set with irregular rows of little prickles; there is no nail, but instead, at the rounded tip of the finger, a strong spine, not quite two-thirds the length of the base, distally pectinate on the inner margin; the usual couple of setules, one long, the other short, are placed near it.

First Gnathopods.—The side-plates much broader below than above, the front margin oblique, a little concave, the front corner much produced forwards. The first joint reaching a little below the side-plate, the margins nearly straight except at the base of the hind margin and at the lower end in front, which is produced in a rounded lobe overlapping the following joint; there are some slender setiform spines on the upper part of the hind margin, and a few long ones on the surface; the second joint rather longer than broad, with a small group of slight spines near the apex behind; the third joint longer than the second, narrowing distally, with slender spines at two points below the middle of the hind margin, some across the short, concave, pectinately furred, apical margin, and others near the convex front margin; the wrist triangular, twice as long as broad, with short spines at two points near the middle of the slightly convex front margin, and

longer spines at its apex; the hind margin microscopically pectinate or furred, fringed with slender spines in six or seven small groups; there are three groups also on the inner surface at a distance from the hind margin; the hand between oval and oblong, nearly as long as the wrist, with four groups of spines at the slightly convex front margin, five or six along the almost straight hind margin, which makes an obtuse angle at the oblique slightly convex palm; the palm is defined by a palmar spine, and bordered with slender spines of various lengths, its edge like that of the hind margin being microscopically furred or pectinate; there are setiform spines at six points of the inner surface, distant from the hind margin; the finger is broad and strong, the outer margin much curved, with a small dorsal cilium near the base, the inner margin fitting the palm, cut into sinuous decurrent teeth, and ending in a very sharp nail, which projects beyond the palm.

Second Gnathopods.—The side-plates a little broader below than above, deeper than the preceding pair, and much wider above, but scarcely so wide below. The marsupial plates long and rather narrow, longer and a little wider than the first joint; distally tapering to a point, closely set all round with a vast number of very long setæ. The first joint reaching beyond the side-plate, rather larger and stouter than the first joint in the preceding pair, and less constricted at the base, with several groups of long spines on the hind margin, the front produced below in a rounded lobe; the second and third joints nearly as in the preceding pair, but rather broader, and the third with more spines, and the distal margin less contracted; the wrist shorter than the hand, but distally wider, the distal width being almost equal to the length; the convex hind margin smooth, but the distal margin, where it projects beyond the hind margin of the hand, carrying an immense brush of long slender spines; the hand almost oblong, very similar to that of the first gnathopods, but wider, the width scarcely varying from near the base to the origin of the palm; the armature of the hand and the finger are similar to those in the preceding pair.

First Peræopods.—The side-plates larger than the preceding pair, tending to oblong, but broader above than below, and with the corners rounded, especially the lower front one. The branchial vesicles large and inflated, rather longer than the first joint. The marsupial plates similar to the preceding pair, longer than the branchial vesicles. The first joint reaching beyond the side-plate, containing rows of dark gland-cells, of nearly uniform breadth except at the base, much wider as well as much longer than any of the following joints, with many groups of long spines along the hind margin, the front margin fringed with spines and setæ; the second joint scarcely longer than broad, with spines at the apex behind; the third joint widening distally, broader but scarcely longer than the fourth joint, with spines or spinules at four points of the straight pectinately furred hind margin, spinules at two points in front and long slender spines at the apex; the fourth joint narrowing a little distally, with slender spines at five points of the straight scabrous

hind margin, those near the apex forming a broad row of very long thin spines; the slightly curved front margin is slightly armed at three points; the fifth joint is longer than the third or fourth, narrowing a little distally, with seven groups of slender spines behind, with spinules at two points high up on the slightly curved front, and a group of setæ or setiform spines at the apex; the finger is about half the length of the fifth joint, and has an opening in the apex.

Second Peræopods.—These, with their side-plates, are in close agreement with the preceding, but a little longer; the third joint has six or seven groups of spines, the fourth has five, and the fifth has eight, on the front margin.

Third Peræopods.—The side-plates nearly as deep as the preceding pair, and full as broad even below, considerably broader above by the addition of the small hind lobe. The branchial vesicles as broad as the first joint. The marsupial plates are similar in general character to the preceding pairs, but considerably shorter, and more continuously tapering. The first joint irregularly shaped, about as broad as long, the front and hind margins both very convex, the front with seven short, stout spines, followed by some on the lower part that are more slender; the second joint short, longer behind than in front, with some small spines in front at the apex; the third joint rather longer than the fourth, with spines at three or four points behind and two in front; the fourth joint with spines at two points on each margin, those at the apices being long; the fifth joint longer than either the third or fourth, with six groups of spines along the hind margin, comprising strong and slender spines in each group, the apex of the joint on the inner side forming two small laminar projections, on the outer side set with numerous slender setæ much longer than the finger; the finger curved, acute, about half the length of the fifth joint.

Fourth Peræopods.—The side-plates shallow, with several setæ on the front edge of the front lobe; the hind lobe less deep but broader than the front, with a spine in a notch at the lower hind corner. The branchial vesicles large and inflated. The limb longer than the preceding pair.

Fifth Peræopods.—The side-plates not bilobed, rather deeper behind than in front. The limb longer than the preceding pair; the first joint pear-shaped.

Pleopods.—The peduncles (at least of the first pair), instead of the more usual pair of coupling spines on each peduncle, have a row numbering about a dozen; they are short and small, with one pair of retroverted hooks at the apex; the cleft spines form a row of nine; the joints of the outer ramus number twenty-two, of the inner twenty-three; the second and third pairs are very like the first, but perhaps with fewer coupling spines, seven or eight cleft spines in a series, and a joint less in each of the rami.

Uropods.—The peduncles of the first pair longer than the rami, with strong spines on the inner or upper margins, and slight ones on the lower or outer margin; the outer ramus a little shorter than the inner, both with stout spines along the inner margin and

an apical group; the peduncles of the second pair reaching a little beyond those of the first, a little longer than the rami, with strong spines on the lower half of the inner margin; the outer ramus shorter than the inner, both armed as in the preceding pair, but with rather stronger spines, the rami themselves rather broader, and respectively reaching a little beyond the other two; the peduncles of the third pair much longer than the rami, reaching beyond the telson, and carrying some short stout marginal and apical spines and some lateral groups of long slender spines; the rami short and subequal, the outer narrowing distally, with two apical spines, stout and curving upwards, the outer the stronger; there is a short stout spine at the upper part of the upper margin; the lower margin is convex; the inner ramus tapers less, has four stout spines and three slender ones fringing the truncate apex, two small spines on the straight upper margin, and some small stout surface spines.

The Telson is scarcely longer than broad, widest near the base, the sides then converging with a straight course to the still wide distal margin, which forms an angle with each of the sides, but is itself convex; at each angle there is a little tooth on the surface; there are two slender spines near each margin, two pairs wide apart on the surface some way above the distal margin, one in each pair very long, and some spinules at different points.

Length.—The length of the specimen, without the antennæ, was eleven-twentieths of an inch.

Locality.—Station 233, Bay of Kobé, Japan, May 17, 1875; depth, 8 fathoms; bottom, mud. Three specimens.

Remark.—The specific name is derived from the locality. The great similarity which prevails among the more or less definitely ascertained species of this genus, and the scantiness of the details which in many instances have been thought sufficient for their identification, necessarily leave new species on a very insecure footing. To review all the species of *Amphithoë* will be a task by itself for any one who is willing to undertake it.

Genus *Podocerus*, Leach, 1814.

1814. *Podocerus*, Leach, Crustaceology, Appendix, Edinburgh Encyclopædia, vol. vii. p. 433.
1814. *Jassa*, Leach, Crustaceology, Appendix, Edinburgh Encyclopædia, vol. vii. p. 433.
1815. *Podocerus*, Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii. p. 361.
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1816. *Pedocère*, Latreille, Nouveau Dict. d'hist. Nat., vol. i. p. 469.
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1825. *Jassa*, Desmarest, Consid. gén. sur la classe des Crustacés, p. 269.

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1829. *Jassa*, Latreille, Le Règne Animal, t. iv.
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1847. *Podocerus*, Leuckart, Beiträge zur Kenntniss der wirbelloser Thiere, p. 163.
1847. *Cerapus*, W. Thompson, Ann. and Mag. Nat. Hist., vol. xx.
1847. *Jassa*, W. Thompson, Ann. and Mag. Nat. Hist., vol. xx.
1847. *Cerapus*, White, List of Crust. Brit Mus., p. 89.
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1857. ,, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 16 (sep. copy).
1857. ,, Costa, Ricerche sui Crost. Amf. Nap., pp. 176, 230.
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1857. *Jassa*, White, Popular History of British Crustacea, p. 198.
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1866. *Podocerus*, Heller, Beiträge zur näheren Kenntniss der Amph. des Adriat. Meeres, p. 45.
1868. ,, Czerniavski, Materialia ad zoographiam ponticam comparatam, p. 99.
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1872. *Podocerus*, Boeck, Bidrag til Californiens Amphipodefauna, p. 41.
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1875. „ Miers, Ann. and Mag. Nat. Hist., ser. 4, vol. xvi. p. 75.
1876. „ Boeck, De Skand. og Arkt. Amph. p. 599.
1876. *Janassa*, Boeck, De Skand. og Arkt. Amph., p. 600.
1877. *Podocerus*, Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 154.
1877. „ Stalio, Catalogo dei Crost. dell' Adriatico, p. 169.
1878. „ Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 57.
1879. „ Hoek, Carcinologisches, p. 120.
1879. „ Miers, Phil. Trans. Roy. Soc. Lond., vol. 168, p. 210.
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1883. *Podocerus*, Chilton, Trans. New Zealand Inst., vol. xv. p. 84.
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1884. „ Miers, Report on Zool. Coll. H.M.S. "Alert," p. 319.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 394.
1885. „ De Guerne, Revue Scientifique (revue rose) 14 Mars 1885.
1885. „ Sars, Den norske Nordhavs-Exp., p. 205.
1886. „ Fowler, First Report upon the Fauna of Liverpool Bay, p. 216.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.
1887. „ Bonnier, Catal. Crust. Malac. Concarneau, p. 111.
1887. „ Chevreux, Catal. Crust. Amph. Bretagne, p. 28.
1887. *Janassa*, Chevreux, Catal. Crust. Amph. Bretagne, p. 27.

For the original definition of the genus *Podocerus* and of the genus *Jassa*, see Note on Leach, 1814 (p. 86); for the definition of *Ischyrocerus*, see Note on Krøyer, 1838 (p. 179); for that of *Cratophium*, see Note on Dana, 1852 (p. 257); for that of *Janassa*, see Note on Boeck, 1870 (p. 402). Boeck in 1876 thus defines the genus *Podocerus*:—

"*Mandibles* with the palp elongate, not broad; the last joint of the palp apically rounded and furnished with very many plumose setæ.

"Front side-plates small.

"*Upper Antennæ* with the third joint of the peduncle tolerably long; the flagellum short but multiarticulate; the accessory flagellum small.

"*Second Gnathopods* very large, stronger in the male than in the female; the fifth joint constituting a subcheliform hand.

"*First* and *Second Peræopods* with the first joint only a little dilated.

"*Third Uropods* biramous; the rami short but thick.

"The *Telson* thick."

To these should be added, from his account of the subfamily Podocerinæ, the following characters :—

"*Upper Lip* apically little sinuate.

"Secondary plate of the *Mandibles* large.

"*Lower Lip* broad.

"*First Maxillæ* having the palp armed with few, elongate spines; the inner plate little, ovate, without setæ.

"*Second Maxillæ* broad; the outer plate very broad and longer than the inner.

"*Maxillipeds* with the plates of moderate size; the inner plate armed with three teeth, the outer with very many strong teeth [on the inner margin], longer teeth on the apical margin, the series ending with curved setæ on the outer margin; the palp very large; the second joint elongate.

"The body subdepressed; the back rounded; the side-plates small.

"The *Eyes* situated on the lateral lobes of the head.

"*Upper Antennæ* with the peduncle long; the third joint almost equalling the second in length.

"*Lower Antennæ* with the flagellum of few or many, never very many, joints.

"*First Gnathopods* subchelate, smaller than the *Second*.

"*Telson* thick, furnished with spines or teeth."

The other characters mentioned by Boeck have either been included in his character of the family, or do not refer to the genus *Podocerus*. It has been pointed out by S. I. Smith[1] that for *Cerapus* [*Ericthonius*] *longimanus*, which Boeck assigns to this group, he himself figures the inner plate of the first maxillæ with setæ, so that the absence of setæ from that plate is not a valid character of the group. It may be added that in the description of *Podocerus latipes*, Krøyer, Boeck expressly states that the inner plate of the first maxillæ has setæ on the apex.

Podocerus falcatus (Montagu) (Pl. CXIX.).

1808. *Cancer Gammarus falcatus*, Montagu, Trans. Linn. Soc. Lond., vol. ix. p. 100, pl. v. fig. 2.
1847. *Cerapus falcatus*, Thompson, Ann. and Mag. Nat. Hist., vol. xx.
1857. *Podocerus falcatus*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 16 (sep. copy).
1857. *Jassa falcata*, White, Popular History of British Crustacea, p. 198.
1862. *Podocerus falcatus*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 255, pl. xliv. fig. 1.
1862. „ „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 445, fig.
1869. „ „ Norman, Last Report on Dredging among the Shetland Isles, p. 285.
1870. „ „ Boeck, Crust. amph. bor. et arct., p. 168 (248).
1876. „ „ Boeck, De Skand. og Arkt. Amph., p. 605, pl. xxvii. figs. 4, 7; pl. xxviii. fig. 2.

[1] Trans. Connect. Acad., vol. iv., July 1880, p. 270, footnote.

1879. *Podocerus falcatus*, Hoek, Carcinologisches, p. 120, pl. viii. figs. 13–15; pl. ix. figs. 1–3.
1880. „ „ Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 41, pl. iv. fig. 44.
1882. „ „ Sars, Oversigt af Norges Crustaceer, pp. 31, 112.
1885. „ „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 394.
1887. „ „ Bonnier, Catal. Crust. Malac. Concarneau, p. 111.

To give what is now supposed to be the full synonymy of *Podocerus falcatus*, would be to repeat the great majority of the references already given for the genus. Leach is inclined to adopt the name *Jassa falcata* for Montagu's species, but he does not definitely adopt it. Meinert, Chevreux, Koehler, and perhaps some other writers, have used the actual name *Podocerus falcatus*, but as a rule I do not think it necessary to enlarge the synonymy of a species by references to simple catalogue names. It will be of interest here to notice how the grouping of various forms and various names under one species has gradually arisen. In 1857 Spence Bate in his Synopsis, giving the species "*P. falcatus* (Montagu)," but omitting *Jassa pelagica*, Leach, remarks in a footnote, "It is usual to divide this genus into two, *Podocerus* and *Jassa*, but there is great reason to believe that the difference is merely sexual. It is evidently synonymous with Dana's genus *Cratophium;* the species *C. validum* being almost identical with *P. pulchellus*." Norman in 1869, mentioning five species of *Podocerus*, makes "*Podocerus falcatus* (Montagu)" the fourth, and "*Podocerus pelagicus* (Leach)" the fifth, but in reference to the place of capture, says of the latter, "With the last, of which I believe it to be the female. I have never met with a male *pelagicus*, nor a female *falcatus*. The two forms occur in company, and the structural differences seem confined to the exact form of the hand of the gnathopods, organs which seem generally to differ among the Amphipoda according to the sex." Boeck in 1870 and 1876 places in the synonymy of *Podocerus falcatus*, Montagu, the species *Jassa pulchella*, Leach, *Jassa pelagica*, Leach, *Cerapus pelagicus*, Milne-Edwards, *Podocerus calcaratus*, Rathke, and *Podocerus monodon*, Heller. In regard to the union of the three forms named respectively *falcatus*, *pulchellus*, and *pelagicus*, Metzger and Meinert imply their agreement with Boeck, and Hoek definitely expresses and gives reasons for his. Nebeski in 1880 adds the form known as *Podocerus variegatus*, Leach, which Boeck had named *Janassa variegata*, at the same time making *Podocerus capillatus*, Rathke, a synonym of it. Bonnier in 1887 accepts the whole group thus united, but presumably on the authority of the various authors mentioned.

Lower Antennæ.—In the male specimen the flagellum has six joints, the first much longer than any of the following; in the female specimen the flagellum has only two joints, the first long and stout. Boeck in describing *Podocerus falcatus* says that the flagellum of the lower antennæ has five joints, of which the first is the longest; for *Janassa variegata* he says that this flagellum is composed of a long first joint, which is narrower than the last joint of the peduncle, but nearly as long, and of two short joints.

Mandibles.—The cutting edge is divided into five teeth; the secondary plate on the left mandible has four teeth, on the right mandible two moderately conspicuous teeth and three very inconspicuous denticles; the spine-row has five spines on the left, and four on the right mandible; the molar tubercle on each mandible has a very irregular edge to the crown, and in a cavity of this edge is planted a small lamina, narrow at the base, distally crenulate, with a breadth about equal to the length.

It is probably to this which Boeck alludes when he says,[1] "Tyggeknuden er meget hoi, og den nedre Tandrad afbrydes i den indre Kant af en Børste," but to speak of this laminar process as a seta seems inappropriate and misleading.

Lower Lip.—Principal lobes rather widely dehiscent, inner margins strongly ciliated, the outer margins with a small interruption as if an incipient jointing near the apex; the oval inner lobes filling up a portion of the gap between the other two, the inner and distal margins well ciliated; the mandibular processes rather long, narrow, and divergent.

First Maxillæ.—The inner plate narrow; the outer plate carrying on the broad distal margin nine spines, each of which appears to have a small lateral tooth on the outer or on the inner margin; in some of the spines there may be more than one such tooth on the inner margin; the first joint of the palp very short, the second very long, carrying on the dentate apex four serrate spine-teeth, with two that are narrower on the inner margin just below the apex; there are also several slender spines crossing the surface from the outer apex to the inner margin. Boeck in describing the outer plate of these maxillæ says there are *six* strong spines, each of which is armed on the concave edge, near the apex, with a little accessory tooth. In *Podocerus latipes* he also mentions only *six* spines, but that is probably in both species rather the number he observed than the full normal number.

Second Maxillæ.—The inner plate rather shorter and narrower than the inner, with plumose setæ or setiform spines descending to the middle of the inner margin.

Maxillipeds.—The inner plates have on the widened distal margin some curved plumose spines and three small spine-teeth which are not set close together; a row of seven plumose setæ, beginning rather far up the inner margin, passes across towards the distal margin; the outer plates do not reach to the apex of the second joint of the palp; the crenulate inner margin has seven graduated serrate spine-teeth; on the apical margin the series is continued by three that are similar but longer and by two long setæ.

Second Gnathopods.—The inner margin of the finger is not denticulate, but carries a series of small not very prominent spine-teeth.

Locality.—A specimen that appears to be a female of this species was taken from the screw of the ship on the 18th of December 1873. This date corresponds with Station 142, in the neighbourhood of the Cape of Good Hope, lat. 35° 4′ S., long. 18° 37′ E.

[1] De Skand. og Arkt. Amph., p. 607.

Station 149E, Greenland Harbour, Kerguelen Island, January 21, 1874; depth, 30 fathoms; bottom, volcanic mud. One specimen. Dredged.

Remarks.—There is the possibility, as I have elsewhere suggested, that these creatures may have travelled out from our own waters along with the vessel to the southern latitudes at which they were captured.

Podocerus validus (Dana) (Pl. CXXXVIII. B).

1852. *Cratophium validum*, Dana, U.S. Explor. Exped., p. 841, pl. lvi. fig. 2.
1862. *Podocerus validus*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 253, pl. xliii. fig. 9.
1886. „ „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 143.

Upper Antennæ.—The third joint of the peduncle longer than the first, shorter than the second; the flagellum much more slender than the peduncle, of six joints, together scarcely longer than the second of the peduncle, the first much longer than any of the others, the second not completely separated from the first; the secondary flagellum slender, scarcely half the length of the first joint of the primary, two-jointed, but the second joint minute, tipped with setules as long as the secondary flagellum itself.

Lower Antennæ.—Peduncle stout; the flagellum also stout except the small fourth joint at the apex, the four joints together as long as the fourth joint of the peduncle, the first joint being much longer than the other three together, bordered with many spines, both slender and short stout curved ones, the remaining joints having similar armature apically.

Mandibles.—The cutting edge with four or five teeth on the left mandible, with five on the right, of which the lowest but one is conspicuously the largest; the secondary plate with four teeth on the left mandible, on the right mandible with one tooth and a denticulate border above it not cut into actual teeth; the spine-row with three broad spines (serrate on the outer edge) on the left mandible, and two such on the right mandible. The molar tubercle powerful, very similar to that described for *Podocerus falcatus;* the first joint of the palp short, widening distally; the second joint broad, at first widening, but narrowing at the distal part, carrying many spines on and near the irregular front margin; the third joint shorter than the second, from a very narrow neck widening rapidly, along the distal half of the inner margin and round the broad apex carrying many unequal, long and broad, slightly feathered, more or less curved spines.

Maxillipeds.—The inner and outer plates not very different from those of *Podocerus falcatus;* the palp broad, the first joint almost triangular, reaching beyond the inner plates, the second joint not twice as long as the first, with many slender spines about the inner and apical margins, and the inner apex having two that are very long; the

outer margin, besides some small spines at the apex, has a group at some distance below it; the third joint little longer than the first, its distal half beset with very numerous spines; the finger short, having at its blunt apex an ungual spine much longer than the base, accompanied by several shorter spines on the inner part of the apex of the finger.

Pleopods.—Coupling spines small, slightly bent, with two retroverted hooks on one margin and three on the other, the apical in each case included, the cleft spines five in the series on one of the pairs, four on another; the joints of the rami eleven in the inner ramus, twelve in the outer.

Third Uropods.—The peduncles broad and long with a small stout spine at the inner apex, three along the middle of the distal border and several slender spines at the outer apex; the rami short, the inner a narrow oval, with a small spine at the apex, the outer broad near the base, narrowing distally, with an upturned spine at the apex, and two retroverted spines close above it, the nearest having a very broad base.

Telson almost an equilateral triangle, with two feathered setæ at the apex, and one near each margin higher up.

Locality.—The specimen from which the figures were drawn had been mounted in glycerine during the voyage, and was labelled as having been taken at the surface in the Pacific, December 28, 1875. This date corresponds with Station 302, lat. 42° 43′ S., long. 82° 11′ W.

A second specimen, which also appears to belong to this species, was also mounted during the voyage, this one in Canada balsam, and labelled as having been procured also at the surface, "Philippines, off Tablas."

Remark.—Mr. Chilton[1] says of his *Podocerus frequens*—"This species appears closely to resemble *P. validus*, Dana, from Rio Janeiro, but that species has the inferior antennæ 'very stout.'" He adds that "the process on the propodos of second gnathopoda of male varies in size in different specimens, and is often longer and more distinct than shown" in his figure. A specimen of the large second gnathopod of *Podocerus validus* from New Zealand was kindly sent me for comparison by Mr. G. M. Thomson.

Podocerus hoeki, n. sp. (Pl. CXX.).

Rostrum small, lateral lobes of the head not large or very prominent, rather acute above; the postero-lateral angles of the first three pleon-segments rounded, especially those of the first segment, those of the third the least so. The animal everywhere covered with little dots that are bright when seen with transmitted light.

Eyes not perceived.

[1] Trans. New Zealand Inst., vol. xv. p. 85, 1883.

Upper Antennæ.—The first joint thick, shorter than the head, with slender spines at three points of the under margin; the second joint longer, much thinner, with spines at six points of the under margin, and spinules at three or four of the upper; the third joint thinner than the second, a little longer than the first, with spines at five points of the lower margin; the flagellum curved, of six rather stiff joints, together longer than the second joint of the peduncle, each joint tipped with a couple of spines and several setules; the secondary flagellum not half as long or half as broad as the first joint of the primary, consisting of a single narrow joint tipped with a seta and setule.

Lower Antennæ.—The first two joints short, the gland-cone narrow, acute, decurrent; the third joint as long as the two preceding united, with spines at two points of the under margin, and several about the apical; the fourth joint longer and stouter than the second of the upper antennæ, with spines at six points below, and some spinules above; the fifth joint similar, but thinner and slightly longer, both a little curved; the flagellum of five joints tipped with groups of short spines and setæ, the five together equal in length to the second joint of the upper antennæ, the first longer than the two following united, and having several marginal spines and spinules. Both pairs of antennæ have what appear to be little hairy parasites, some of which are figured; in every case they are situated in a group of setæ or setules.

Mandibles.—The cutting edge divided into five teeth; the secondary plate with four teeth, stronger on the left than on the right mandible, the latter having only one that is at all prominent; the spine-row of three spines on the left, seemingly followed by one or two plumose setæ; on the right mandible there are only two spines; the molar tubercle prominent, with long teeth round the crown; in this species the laminar process is much longer than in *Podocerus falcatus*, fully twice as long as broad, bent close to its base, then straight, widening but little distally, much striated or ciliated, with the apical margin faintly denticulate; the first joint of the palp short, distally widened, the second a good deal longer than the third, with many spines along both margins, a small space being vacant at the distal end of the inner and the basal end of the outer margin; the third joint from a narrow neck is expanded distally, the basal part free from spines, but the rest set with many feathered spines round both the outer and inner margin and the broad distal margin, where the spines are long. One mandible is figured in position beside the lower antenna to show the comparative sizes.

Lower Lip.—The principal lobes with the distal margins flattened, the inner lobes oval, neither pair strongly ciliated; the mandibular processes short, conical.

First Maxillæ.—The inner plate small, with a seta on the narrow apex; the outer plate narrow, with nine spines on the truncate distal margin, of which two have a single lateral tooth near the apex on the outer side, one may be considered as furcate, and the remainder have one denticle, two, or none, on the inner side; the first joint of the palp

is very short, the second rather long, widening distally, with a very convex outer margin, reaching a little beyond the outer plate, having seven spine-teeth set very closely round the angled distal margin, and having seven slender spines arranged near the top of the inner margin and under the distal margin.

Second Maxillæ.—The inner plate shorter and much narrower than the outer, the row of plumose setæ beginning above the midde of the inner margin, the row of spines rather higher and continuing round the apex, but not descending the outer margin; the longer spines of the outer plate begin at the top of the inner margin, and pass round the broad apex, five or six of them being on its outer slope.

Maxillipeds.—The inner plates reaching beyond the first joint of the palp, having several plumose setæ on the inner margin, with a spine-tooth near and a denticle close to the apex, and on the somewhat angled distal margin three strong spine-teeth and several feathered spines; the outer plates not reaching the end of the second joint of the palp, their base very short, the serrate inner margin set with eight or nine spine-teeth, closely followed by eight spines on the serrate distal margin, the first four elongate spine-teeth, the last four tending to setiform; the first joint of the palp very short, the second two or three times as long, with setiform spines along the inner margin and round the apical; the third joint longer than the first, narrow, a little widened distally, with spines on the upper part of the inner margin, round the apical, and across the surface below the apical margin; the finger is nearly as long as the third joint if the ungual spine be included, this substitute for a nail being as long as the broad blunt-ended basal part of the finger, which on the inner margin close to the root of the ungual spine carries half a dozen other spines more slender, but some of them nearly as long.

First Gnathopods.—Side-plates directed a little forward, of nearly even width throughout, the lower and hinder margins convex, the front tending to concave. The first joint reaching much beyond the side-plate, curving forwards, almost unarmed; the second joint short, with a group of several slender spines at the apex behind; the third joint with the convex front and hind margins on the inner surface converging to a pointed apex, with numerous spines along the lower half of the hind margin, some also on the front; on the outer surface this joint is much narrower, its front margin nearly straight; the wrist triangular, distally cup-like, much shorter than the hand, with a minute spine above the centre of the front margin and one or two slender spines at its apex, the hind margin having a large group of spines on the rounded apex and the adjacent distal margin, and a row of six or seven across the surface nearer the hind than the front margin; the hand is long and broad, with seven or eight groups of spines adjacent to the long convex front margin, three or four on or close to the short serrate hind margin, and four or five along the surface nearer the hind than the front margin; at the apex of the hind margin there is a stout palmar spine, and one above and one below it; the palm itself is oblique in a straight course, finely dentate or tuberculate,

fringed with submarginal spines of various lengths. The finger is broad, with the inner margin toothed, closing tightly along the palm till the nail which bends rather sharply on to the surface within the apex of the hind margin; the dorsal cilium is small, close to the base.

Second Gnathopods.—Side-plates considerably larger than the preceding pair. Branchial vesicles narrow, shorter and narrower than the first joint. Marsupial plates longer than the first joint and much broader, especially at the centre, surrounded by setæ which are not extremely long. The limb in the female differing very little from that of the first gnathopods, but with the hand rather larger. In the male the third joint is, as in the female, more oblong than in the preceding pair, with several spines about the distal margin which is pointed in front, rounded behind; the wrist is very small in comparison with the hand, triangular, distally cup-like, with some short stiff spines at the apex of the front margin, and long spines on the short free portion of the hind margin; the hand large, oval, broadest near the base, with many slender feathered spines, distributed much as in the first gnathopods, the serrate hind margin ending in a small apical tooth, within which is a palmar spine, near to which the obliquely sinuous palm is smooth for a short space, then has one or two low tubercles followed by two that are large and irregular in outline, concluding with a nearly straight tract of seven or eight little tubercles which reach the hinge; the broad curved finger bends on to the surface within the palmar spine; the dorsal cilium is short, near the base; the inner edge of the finger is cut into little spine-like rather distant teeth, and has some setules near the base of the nail.

First Peræopods.—Side-plates larger than the preceding pair. Marsupial plates longer than the first joint. The first joint reaching beyond the side-plate, packed with gland-cells in three rows; the margins with a few small spines and spinules; the second joint short, with one or two slender spines at the hinder apex; the third joint longer than the fourth, as long as the fifth, widening downwards, a little decurrent, with slender apical spines; the fourth joint slightly armed at the apex in front, and at two or three points of the hind margin; the fifth joint narrowing distally, the hind margin almost straight, bordered with a few spinules or setules; the finger narrow, curved, about three-quarters as long as the fifth joint, with an opening in the tip.

Second Peræopods.—The side-plates larger than the preceding pair, the margins convex. The limb like that of the first peræopods.

Third Peræopods.—The first joint broad throughout its length, with five or six minute spines on the front margin and two or three slender ones at its apex, the convex hind margin almost smooth; the second joint short with some spinules at the apex in front; the third joint much longer than the fourth, about as long as the fifth, with spines at three points of the hind margin, and at two of the front; the fourth joint with spines at two points in front, and a group at the apex behind; the fifth joint with spines

at four points in front and a small group at the apex behind; the finger more than half the length of the fifth joint, curved, acute, with a very small dorsal cilium.

Fourth Peræopods longer than the third, similar, except that the front margin of the first joint is straighter, and the hind margin rather sinuous, the joint being a good deal narrower below than above.

Fifth Peræopods like the fourth, but longer, and with the fifth joint longer than the third.

Pleopods.—Coupling spines very thin, bent, with two or three small lateral hooks; the cleft spines not well made out, apparently three or four in a series; joints of the rami about ten in number.

Uropods.—Peduncles of the first pair longer than the rami, with five spines on one of the upper margins and six on the other, and the usual large spine on the lower apex; the outer ramus shorter than the inner, with five spines on one margin, one on the other, and a small apical group; the inner ramus with one margin free, otherwise armed like the outer; the peduncles of the second pair a little longer than the inner ramus, the apical spine short; the shorter outer ramus has four spines on each margin and an apical group; the inner ramus has seven on one margin, two on the other, and an apical group; the peduncles of the third pair longer than the rami, reaching beyond the other peduncles and the telson, with five or six groups of spines along the inner margin, and six small spines about the distal margin in two groups; the rami are short and narrow, subequal, with the acute apices a little bent, especially that of the slightly shorter outer ramus, this apex being a little pectinate; the inner ramus has a marginal spine.

The Telson in outline forms a pointed arch reversed, about as long as the greatest breadth; below it appears to have a carina, narrow near the apex, but towards the base spreading out into a triangular surface.

Length.—The male specimen from which fig. *gn.*2. ♂. was drawn, measured just over a fifth of an inch, in a straight line from the front of the head to the extremity of the uropods.

Locality.—Station 168, off New Zealand, July 8, 1874; lat. 40° 28′ S.; long. 177° 43′ E.; depth, 1100 fathoms; bottom, blue mud; bottom temperature 37°·2. Two specimens, male and female.

Remarks.—All the figures except *gn.*2. were drawn from the female specimen.

The specific name is given in compliment to Dr. P. P. C. Hoek, who in 1882 gave a brief description and some figures of a new species, *Podocerus tuberculatus*, among the Crustacea of the "Willem Barents" Expedition. This species was obtained in lat. 71° 23′ N., long. 49° 38′ E., and judging only from the preliminary description and the figures of the two gnathopods, third uropods, and telson, presents an extraordinary resemblance

to the Challenger species. The finger, however, in each gnathopod, is figured without the least trace of dentation on the inner margin, and the tuberculation of the palm in the second gnathopod, though similar, is not exactly like that of our species. Considering the enormous distance between the places of capture, I have not thought it right to identify the two forms. Had they belonged to a single species of so wide a distribution, it is highly improbable that it would have escaped discovery for so long, and then suddenly have been discovered almost simultaneously at two enormously distant points.

Podocerus tristanensis, n. sp. (Pl. CXXI.).

Rostrum minute, lateral lobes of the head not large or very prominent, acute above.

Eyes rounded, oval, occupying the lateral lobes of the head, dark in the specimens preserved in spirits.

Upper Antennæ.—The first joint thick, not quite so long as the head; with setiform spines at four or five points of the lower margin; the second joint longer, much thinner, with spines at five points of the lower margin; the third joint about as long as the second, with spines at six points, several of them feathered and of great length, on each joint the distal spines the longest; the flagellum of four joints, together longer than the third joint of the peduncle, with similar spines at each lower apex, the first joint the longest of the four and having spines at two points of the lower margin besides those at the apex.

Lower Antennæ.—The first two joints short, gland-cone small, decurrent; the third longer than the preceding two united; the fourth as long as the second of the upper antennæ and stouter, with spines at five points of the lower margin; the fifth joint rather longer, with six groups of spines; the flagellum of four joints, together as long as the third and fourth of the peduncle united, all carrying long apical spines and setæ, but not so long as those on the upper antennæ; the spine at the apex of the fourth joint shorter than the others.

Mandibles.—The cutting edge of both the principal and secondary plates appeared to be cut into several little teeth, of which two only on the right mandible are conspicuous in the secondary plate; the spine-row consisting of three denticulate spines on the left, and two on the right, mandible; the molar tubercle prominent, with strongly denticulate crown and a long seta; the laminar process on the front margin of the tubercle seems to be similar to that described for *Podocerus falcatus;* the first joint of the palp short, widening a little distally, the second joint longer than the third, with about seven pairs of spines along the front; the third joint with about a dozen long pectinate spines round the broad apex, three or four on the convex front margin, a row of four long ones across the middle of the outer surface, and two, one above the other, close to the convex outer margin.

Lower Lip.—The inner margins of the principal lobes not strongly sinuous; the mandibular processes rather long and divergent.

First Maxillæ.—The inner plate very small; the outer plate apparently carrying nine spines, of which the denticulation could not be clearly made out; the first joint of the palp very short, the second long, with four serrate spines on the apical margin, and three slender submarginal spines.

Second Maxillæ.—The inner plate shorter and narrower than the outer; the spines tolerably numerous on the apical border in each, not descending the outer margin in either.

Maxillipeds.—The inner plates not reaching quite to the distal end of the first joint of the palp, with a few setæ on the inner margin and several feathered spines on the broad distal margin, which probably also carries the usual three spine-teeth; in the figure the inner margin of this plate faces outward; when the maxillipeds are divided into two halves, the inner plate as a rule becomes reversed; the outer plates not nearly reaching the end of the second joint of the palp, with five spine-teeth on the serrate inner margin, and three or four more spines, partly spine-teeth, partly setiform, on the serrate apical margin; the first joint of the palp short, with a spine at the outer apex; the second more than twice as long as the first, with a spine at the outer apex, and many spines along the inner margin; the third joint narrower than the first, scarcely longer, with spines at the upper part of the inner margin and all round the apical margin; the trunk of the finger very little longer than broad, the slender apical spines longer than the trunk, the two together longer than the third joint.

First Gnathopods.—The side-plates broader than deep, the hind margin deeper than the front. The first joint reaching beyond the side-plates, narrow, widening distally, not longer than the wrist, almost entirely unarmed; the second joint short, with slender spines at the apex behind; the third joint with front and hind margins convex, each with a group of spines, the distal scarcely distinct from the hind margin, with seven feathered spines at the junction; the wrist much longer than broad, the front margin smooth, with an apical spine, the hind margin more convex than the front, fringed with numerous feathered geniculate spines; the surface carries five spines in three groups at a little distance from the hind margin; the hand tending to oblong, subequal in length to the wrist, with five groups of spines near the almost straight front margin, four single spines along the centre of the surface, and near the almost straight hind margin three or four groups; on this margin there are two stout spines, one at the centre, one nearer the apex, which may be considered as palmar spines, though remote from the palm, which is short, nearly straight, finely pectinate, joining the finely pectinate distal part of the hind margin by a rounded angle; the finger is broad, with a finely pectinate nearly straight inner margin ending in a tooth at the base of the strongly curved nail, and having three or four submarginal setules along its course, and a little spine-tooth near the centre; the finger

for half its length projects beyond the palm; the dorsal cilium is rather long, close to the base. In the female the shape of the gnathopods is the same, the spines are fewer; the side-plates are directed a little forwards, narrow, the lower margin very convex, separated from the hinder by a little notch.

Second Gnathopods.—Side-plates rather larger than the preceding pair, the breadth and depth about equal, the margins convex. The branchial vesicles very small, oval, the two following pairs larger, the fourth and fifth pairs again smaller. The first joint much shorter than the hand, bent forwards, narrow at the base, distally, beyond the side-plate, expanded in front into a rounded lobe carrying a couple of spinules; the second joint is very short, broader than long; the third not much longer than broad, with spines on the distal margin; the wrist very short, broader than long, distally cup-like, with a few spines on the apex behind; the hand broad and long, not twice as long as broad, with some spinules at the apex of the slightly convex front margin, and a couple of setules higher up; the much shorter hind margin has three groups of slender spines upon it and other spines on the adjacent surface, and apically forms a tooth-process, nearly an equilateral triangle, from which the long concave palm runs almost parallel to the front margin towards the finger, bordered with many submarginal slender spines, and before reaching the hinge bends abruptly, then conforming to the inner margin of the finger; the finger is stout, much curved, the inner margin smooth, the short nail reaching the triangular process already mentioned, of which the inner margin is crenulate; the part of the palm-margin near the finger appears to be finely serrate; the dorsal cilium of the finger is very short. In the female the first joint is less expanded distally, the hind margin of the hand is relatively longer, the palm rather shorter, the triangular process at the junction less conspicuous and accompanied by two submarginal palmar spines which were not observed in the other form; the finger is broad, curved, with the inner margin finely pectinate, carrying two little spine-teeth, and ending in a larger tooth, accompanied by three setules, at the base of the long curved smooth-edged nail, which reaches beyond the triangular process, of which the outer margin is pectinate. The dorsal cilium is long.

First Peræopods.—Side-plates rather deeper than broad. The first joint packed with three rows of gland-cells, reaching a little beyond the side-plate, not twice as long as broad, the front margin more convex than the hinder, with a spinule below the centre, the hind margin carrying three or four spinules, the distal margin projecting beyond the next joint; the second joint a little longer than broad, with an apical spinule; the third joint much longer than the fourth, and a little longer than the fifth, with a group of spines on the decurrent front apex, and a small spine higher up, the much shorter hind margin similarly armed; the fourth joint very little longer than broad, with two single spines on the hind margin, and an apical group; the fifth joint with two spinules on the convex front margin, and a group of slender spines at its apex, the hind margin almost straight, with two single stiff spines, followed by three small groups of slender spines;

the finger curved, almost as long as the fifth joint, with a small dorsal cilium near the base, and an opening in the apex.

Second Peræopods scarcely differing from the first, except that the first joint is more dilated, oval, with two spinules on the very convex front margin, and some long spines on the surface near the hind margin and at its apex.

Third Peræopods.—Side-plates with the front lobe as deep as the preceding side-plates, the hind lobe small. The limb missing. The side-plate and branchial vesicle are figured in position together with *prp.*2. ♂ .

Fourth Peræopods missing.

Fifth Peræopods.—The first joint little but evenly dilated, shorter than the fifth joint, with four or five spinules on each margin; the second joint longer than broad, with a spinule on the apex in front; the third joint longer than the fourth, shorter than the first or fifth, with slender spines at each apex, and a spine or spinule on each margin higher up; the fourth joint similarly armed; the fifth with a group of slender spines at the apex of the hind margin and a spinule at its centre, slender spines at three points of the straight front margin, and two little stiff spines close to the finger; the finger is short, curved, with two or three very small setules along the otherwise smooth inner margin.

Pleopods.—Coupling spines minute, narrow, bent, with two pairs of hooks; there appeared to be only one cleft spine on the inner ramus; the joints of the rami five in number; the outer ramus rather the shorter, with its first joint more dilated than the first of the inner ramus.

Uropods.—Peduncles of the first pair longer than the rami, with four spines on each of the upper margins, the inner of which has an acute apex; the apical spine below is broad but not very long; the rami are nearly equal, each with three marginal spines and an apical group; the peduncles of the second pair longer than the rami, with three spines on one margin; the outer ramus the shorter, with two spines on the outer margin, one at the blunt apex, and a little one above it, the inner ramus with a spine on the inner margin, and three at or near the apex; the peduncles of the third pair very broad, longer than the rami, reaching beyond the other peduncles, with two setæ on the outer margin, the apical border having two stout spines with two thinner ones on one side and one on the other; of the short rami the outer is a good deal shorter than the inner, with two minute spines at its slightly bent tip, the inner ramus with one such spine a little larger than those of the outer ramus.

The Telson as broad as long, forming a pointed arch, not reaching the end of the peduncles of the third uropods, with a raised point near the margin on each side, some way above the apex, and a cilium adjacent to this tubercle.

Length.—The female specimen, in the position figured, with the pleon folded and the antennæ outstretched, was a tenth of an inch; the male was rather larger.

Locality.—Station 135c, off Nightingale Island, Tristan da Cunha, October 17, 1873; depth, 110 fathoms. Two specimens.

Remarks.—The specific name refers to the place of capture.

Genus *Dryopoides*, n. gen.

Mandibles with dentate cutting edge and secondary plate, spine-row of several spines, the third joint of the palp longer than the second.

Lower Lip with the mandibular processes long and pointed.

First Maxillæ with the inner plate small, carrying a single seta.

Second Maxillæ having a fringe of setæ near the inner margin of the inner plate.

Upper Antennæ.—The first two joints of the peduncle long, the third short; a very small secondary flagellum.

Lower Antennæ not longer than the upper; the fourth and fifth joints of the peduncle elongate.

Gnathopods subchelate, the *First* larger than the *Second.*

The *First* and *Second* pairs of *Peræopods* having the first and third joints a little widened for gland-cells, and having an opening in the apex of the finger.

The *Third*, *Fourth*, and *Fifth* pairs of *Peræopods* with the first joint little dilated; the third pair very short, the fourth pair longer than the third, and the fifth than the fourth.

Uropods with the rami equal in each pair; the third pair with minute rami and short broad peduncles that reach beyond the telson.

Telson simple, almost circular.

Side-plates not deep.

Sixth segment of the *Pleon* dorsally evanescent.

This genus is nearly related to *Dryope*, Spence Bate; in that genus as in this the upper antennæ have a small secondary appendage; the first gnathopod is larger than the second; the first joint in the last three pairs of peræopods is not broadly expanded; the rami of the third uropods are minute; the telson is undivided, approaching a circular form; on the other hand in *Dryope* the first and third joints of the first and second peræopods do not appear to be expanded for gland-cells as in *Dryopoides*, in all three pairs the rami of the uropods are unequal, and the dorsal arch of the sixth pleon-segment though very short is present. The genus *Dryope* was founded by Spence Bate in 1862 (Brit. Mus. Catal. Amph. Crust., p. 276) to receive a species which Gosse had described and figured in 1855 (Marine Zoology, p. 141, fig. 256) as *Unciola irrorata*, Say; to this Spence Bate added a supposed new species, *Dryope crenatipalma.* For the original definition of *Dryope*, see Note on Spence Bate, 1862 (p. 336). The genus is also defined in the British Sessile-eyed Crustacea, vol. i. p. 487, and by Gerstaecker, in Bronn's

Klassen und Ordnungen, Bd. v. Abth. ii. p. 496, 1886. In all three definitions the upper antennæ are said to be without a secondary appendage, although Gosse, in describing the antennæ of the type species, had rightly observed "superior pair furnished with a minute appendage at the base of the lash." Spence Bate describes the three posterior pairs of peræopods (in his specific accounts) as subequal, but in fact the third pair is considerably shorter than those which follow. Gerstaecker in the generic definition says of these three pairs, "die drei letzten Paare verlängert, mit erweitertem Schenkelglied," whereas in fact attention should rather be called to the comparative narrowness of the first joint. The name *Dryope* will require alteration, being, according to Scudder's Nomenclator Zoologicus, preoccupied among Diptera in 1830.

The generic name is derived from *Dryope*, the genus above mentioned, and εἶδος, likeness.

Dryopoides westwoodi, n. sp. (Pl. CXXII.).

Rostrum very small, acute; lateral lobes more advanced, distally rounded, not broad, the head squared below the lobes; the back of the animal flatly rounded; the postero-lateral angles of the first three pleon-segments rounded; the fourth segment of the pleon as long as any of the three preceding segments, having a feathered cilium on the hind margin at either side, not showing any transverse dorsal depression; the fifth segment short; the sixth segment without any dorsal arch, so that from above the telson appears as if attached to the fifth segment.

The Eyes round, with about seventy ocelli in each, situated close to, rather than on, the lateral lobes of the head.

Upper Antennæ longer than the lower, but with much shorter peduncle. The first joint rather longer than the head, slightly curved, with two groups of spines on the under margin; the second joint longer than the first, also slightly curved, with slender spines on the lower margin and some spinules on the upper; the third joint little more than a quarter the length of the second; the flagellum of about thirty joints, the distal longer than those nearer the base, all together much longer than the peduncle; the secondary flagellum not visible on the outer side of the antennæ, consisting of a slender joint, with a minute terminal joint, the two together not so long as the first of the primary.

Lower Antennæ.—The first two joints short, the gland-cone decurrent, but very short; the third joint a little longer than the united first and second, with two groups of spines on the under margin, and two of shorter less slender spines near the upper; the fourth joint long, a little curved, longer than the second of the upper antennæ, slightly widening distally, carrying several groups of spines on both margins; the fifth joint longer than the fourth, with numerous spines; the flagellum not so long as the

fifth joint of the peduncle, of seven principal joints, all carrying strong curved spines at the apices, besides slender spines and setæ both there and elsewhere; there is a group of three strong curved spines on the apex of the seventh joint, but also an appearance of two little terminal joints tipped with long setæ or setiform spines. In both specimens of this species the lower antennæ were unsymmetrical, that is, one of the pair was longer than the other; this, however, is obviously only a curious coincidence, not indicating a specific character.

Upper Lip.—The distal margin broadly rounded, with a shallow central emargination, the tract on either side ciliated.

Mandibles.—The cutting edge with five teeth; the secondary plate with four strong teeth on the left mandible, alternately larger and smaller; the secondary plate on the right mandible consisting of one long tooth with three or four denticles on its upper edge; the spine-row of seven denticulate spines on the left, and six on the right mandible; the molar tubercle prominent, ciliated, with strongly dentate, more or less oval crown; the first joint of the palp longer than broad, slightly curved, and distally widened; the second joint more than twice as long, straight, with several spines grouped on and near the front margin; the third joint longer than the second, the outer margin strongly convex, carrying four long spines near the centre, the inner margin at first smooth and diverging from the outer, but at about a third of its length from the base becoming thickly fringed with pectinate spines, and forming a large concavity, so that the joint ends in a long narrow piece with a small apex, from which projects one strong spine. The left mandible is figured on the right, and the right mandible on the left, of the Plate.

Lower Lip.—The principal lobes not broad, dehiscent, lightly ciliated, but carrying a prominent row of five or six close-set spines at the point where the distal and inner margins meet; the inner lobes are comparatively broad; the mandibular processes are divergent, strongly produced to an acute apex.

First Maxillæ.—Inner plate small, oval, with a single long, slender, apical seta; the outer plate not very broad, the distal spines not in very good condition in our specimen, ten, I believe, in number, in some instances with a single lateral denticle on the inner or outer margin; the others with two or three not very conspicuous denticles on the inner margin; the first joint of the palp short, with a long spine or seta and a short one on the outer apex, the trunk below it having two or three spinules on the outer margin; the second joint widening from the base, subequal in breadth to the outer plate, and reaching beyond it, the dentate distal margin carrying eight spine-teeth, of which the outermost is the longest, and submarginal to these are six slender spines.

Second Maxillæ.—The inner plate a little shorter and a little wider than the outer; a series of six and twenty plumose setæ passes from near the base of the inner margin in a gentle curve towards the outer apex; a little higher up the margin begins a row of plumose spines, which keep pretty close to the margin; the spines round the inner part

of the apex are numerous, but do not descend its outer slope; the outer plate has the inner margin smooth, slightly concave at the centre; numerous long spines fringe the apical border, which on the outer side becomes very oblique.

Maxillipeds.—The inner plates reaching fully as far as the apex of the first joint of the palp, having the usual plumose setæ on the inner margin, the distal margins sloping inwards, carrying three strong but short spine-teeth and several feathered spines; the outer plates not reaching the apex of the second joint of the palp, having nine spine-teeth not very closely set on the slightly crenate inner margin, and five spines round the serrate distal margin, the two outermost too long and slender to be called spine-teeth; the first joint of the palp short, its particularly short inner margin carrying a slender spine; the second joint more than twice as long as the first, with both margins convex, the inner having in or near it many very long slender spines; the third joint a little longer than the first, the convex outer margin interrupted at some distance from the apex by a large row of feathered spines, the distal half of the inner margin and the concave apical margin also carrying spines; the finger slightly curved and tapering to a blunt end, even with its terminal spine scarcely so long as the third joint, the dorsal cilium very near the hinge; the ungual spine scarcely half the length of the trunk of the finger, attended by three or four setules planted near the inner apex of the finger; on one of the fingers the ungual spine seemed to be in duplicate.

The oval *triturating organs* of the stomach show round one side a row of about sixteen spines with stout bases, and on the opposite side numerous slender spines, and some like them on the surface between the two rows.

First Gnathopods.—The side-plates less deep than broad, directed forwards, the lower margin crenate and fringed with setæ. The first joint almost entirely free from the side-plate, the front margin almost straight and smooth, the hind margin convex, with some long feathered setæ above the centre and some apical spines; the second joint short, with spines in two or three groups near the apex of the convex hind margin; the margins of the third joint converging to a pointed apex which lies upon the wrist; one group of spines is near the middle of the hind margin, and two larger groups are between this and the apex; the wrist is not quite so long as the hand, distally nearly as broad, with four groups of spines at the long convex front margin; the free front of the hind margin convex, serrate, closely fringed with spines, some groups also being inserted on the adjoining surface; the hand oval, nearly as long as the first joint, with four transverse rows of long spines at the front margin, which is continuous with that of the wrist; there are several spines, singly and in groups, on the surface near the hind margin; the hind margin serrate, carrying five groups of spines before reaching the palm, and between the apical group and that preceding it having a long and strong palmar spine; the palm itself convex, bordered with spines and spinules; the finger fitting the palm, with a dorsal cilium near the hinge, the inner border cut into many decurrent teeth.

Second Gnathopods rather smaller than the first. The side-plates not very unlike the preceding pair, but deeper than broad, not so strongly directed forward; the lower margin similar. The branchial vesicles oval, broader below than above, as long as the first joint and wider. The marsupial plates rather wide and long. The first joint almost free from the side-plate, narrower than in the first gnathopods, with long setiform spines spaced along the two margins, which are nearly parallel; the second and third joints as in the preceding pair; the wrist as long as the hand and distally wider, with five or six groups of slender spines along the long front margin, and the free part of the hind margin very thickly set with the same; the hand narrower than in the first gnathopods, fully twice as long as broad, of nearly even width throughout, but with the front margin slightly convex, the hinder straight; numerous groups of spines are on and near each margin; the finger appears to be similar to that of the first pair, but is much shorter, and nevertheless its curved tip reaches just beyond the short convex palm.

First Peræopods.—The side-plates as broad as deep, directed forwards, the front margin very convex, the lower straight, a little notched for the setæ. The branchial vesicles as in the preceding segment. The marsupial plates longer and much broader than the first joint, narrowed only at the distal end, the fringing setæ not long in proportion to the breadth of the plate. The first joint almost free from the side-plate, packed with gland-cells, with slender spines along the somewhat convex margins; the second joint with a small spine on the lobe in front, and a group of spines at the apex behind; the third joint broad, longer than the fourth or fifth, with a slender spine at each of two points on the front margin, and a group at its rounded apex, the hind margin with two groups; the fourth joint much narrower than the third, but broad in proportion to its length, with spines at the apex of the front margin, and in several groups along the hind margin, which is also furred with long cilia; the fifth joint longer than the fourth, the front margin convex, with a group of spines or setæ below the middle and another at the apex; the hind margin almost straight, furred, and carrying about eight groups of spines or setæ, which like the rest on this limb are feathered, but more prominently so; the finger curved, more than half the length of the fifth joint, having a feathered cilium near the hinge, and an opening in the apex.

Second Peræopods scarcely differing from the first; the side-plates, branchial vesicles, and marsupial plates a little wider.

Third Peræopods.—The side-plates much broader than deep, the front lobe narrowed below and fringed with setæ, having also many on the inner surface, the hind lobe broad and shallow, with the lower margin nearly straight, the hinder rounded and carrying one or two spines. The branchial vesicles shorter than the preceding pair, very broad at the centre. The marsupial plates narrower than the preceding pair. The first joint of the limb scarcely expanded, but wider than the following joints, twice as long as broad, with spines along both margins, some in the front elongate; the second joint a little longer

than broad, with spines near the apex in front; the third joint longer than the fourth, not quite so long as the fifth, the margins almost parallel, with slender spines at the apices and a spinule or two higher up; the fourth joint similar, a little narrower, and with stout spines as well as the slender at the apex behind; the fifth joint also with the margins nearly parallel, but the hinder a little convex, having slender spines at the apex, the front margin almost straight, with four groups of short strong spines, besides some that are setiform; the lower part furry; the finger strong and curved, more than half the length of the fifth joint, with a feathered dorsal cilium near the hinge, and another near the base of the nail; the concave inner margin strongly furred, and produced into a short thick tooth at the base of the short nail, the tooth having at its base a feathered spiniform seta which is prolonged over the inner margin of the nail.

Fourth Peræopods.—The side-plates smaller than the preceding pair, the front margin fringed with feathered setæ, the convex lower margin of the front lobe smooth, the straight lower margin of the hind lobe having some strong spines. The branchial vesicles not so long as the first joint, broadest a little below the neck. The limb similar to that of the third peræopods, but all the joints longer, the third rather longer instead, of rather shorter than the fifth, the spines more numerous.

Fifth Peræopods like the fourth, but all the joints longer.

Pleopods.—The coupling spines have a stout base, a slender shaft, somewhat bent, the apex forming a strongly bent hook between a pair of lateral hooks, which are also strong; the cleft spines appear to be a series of five in each pair; the joints of the rami number from ten to twelve, the outer ramus being considerably the shorter.

Uropods.—The peduncles of the first pair considerably longer than the rami, with marginal spines, and a spine-process with a broad base on the lower apex; the rami equal in length, reaching beyond the other two pairs, the outer with four short spines on the outer margin, three not so stout on the inner, and a group at the rounded apex, consisting of two subapical and a large apical between two much smaller spines; the other ramus has four on the outer, five on the inner, margin, and the apical group; the peduncles of the second pair are longer than the rami, and have a few spines; the outer ramus nearly equal to the inner, with three stout spines on the outer margin, one more slender on the inner, and the apex as in the first pair; the inner ramus has six spines on the inner, four on the outer, margin, and the apical group; the peduncles of the third pair are short and broad, just reaching beyond the telson, but not so far as the peduncles of the second pair, with a couple of feathered setæ or setules near the outer apex; the rami are diminutive, equal, narrowly oval, not reaching beyond the peduncles of the second pair, the inner carrying a slender feathered spine at the apex, another just above it on the outer side, and a third higher up on the inner side; the outer has a much longer apical spine, which is distally setiform, and a shorter one just above it on the outer side.

Telson broader than long, distally arched in outline, with a blunt central point;

a group of feathered setæ and cilia is planted a little way from the distal margin, not far from each lateral margin.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the extremity of the third uropods, three-tenths of an inch.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. Two specimens. The specimen figured is a female; the other specimen, two-tenths of an inch in length, antennæ not included, is probably a male, differing from the female in having the palm of the first gnathopod partially excavate, near the palmar spine.

Remark.—The specific name is given in honour of the celebrated entomologist, J. O. Westwood.

Genus *Paradryope*, n. gen.

Mandibles with dentate cutting edge and secondary plate, the spine-row with few spines, the molar tubercle prominent, the palp very long, its third joint very little shorter than the second.

Antennæ with the peduncles elongate; *Upper Antennæ* with the third joint longer than the second, and a small accessory flagellum; *Lower Antennæ* with the fifth joint of the peduncle longer than the fourth.

First Gnathopods larger than the *Second.*

Third, *Fourth*, and *Fifth Peræopods* with the first joint little expanded; fourth pair longer than the third, fifth than the fourth.

First and *Second Uropods* with the outer ramus considerably shorter than the inner; *Third Uropods* with the peduncles broad, reaching beyond the telson, the rami minute, the outer a little longer than the inner.

Telson simple.

Side-plates shallow.

Sixth segment of the *Pleon* dorsally well developed.

The generic name refers to the resemblances shown by this genus to *Dryope*, Spence Bate, and the new genus *Dryopoides;* the long-jointed peduncles of the antennæ also recall the genera *Gammaropsis* and *Podoceropsis.*

Paradryope orguion, n. sp. (Pl. CXXIII.).

The Rostrum short, acute, the lateral lobes of the head acute, produced a little beyond the rostrum; the back of the animal rather broadly rounded, with the side-plates shallow; the postero-lateral angles of the first three segments of the pleon slightly rounded, each carrying a spinule; the fourth segment having two dorsal spinules.

The Eyes very small, round, situated near the lateral lobes of the head.

The specimen was mounted in Canada balsam during the voyage, and the full figure was drawn from the animal thus mounted, but in subsequently dealing with it for purposes of dissection I had the misfortune to lose almost all the parts, except fragments of the antennæ and some of the peræopods. Luckily some important details had been drawn before the accident, but it must be understood that these were subsequently described from the drawings, not, as in other instances, from the mounted dissections. It may perhaps be worth while to remark that in the full figure it is the larger gnathopod which is the first, though its terminal joints are to the rear of the smaller second gnathopod.

Upper Antennæ.—The first joint rather longer than the head; the second thinner and considerably longer, with slender spines on the lower margin; the third joint rather longer than the second, the margins serrate, the under fringed with long spines; the flagellum of eight joints, the first longer than any of the others, all together not so long as the first two joints of the peduncle, all carrying long slender spines on the under margin; the secondary flagellum of one slender joint, together with its apical setæ not so long as the first joint of the primary.

Lower Antennæ.—The first two joints very short, the third much longer than the two preceding, but shorter than the first of the upper antennæ; the fourth and fifth joints about equal respectively to the second and the third of the upper antennæ, and similarly armed; the flagellum of nine joints rather longer than the flagellum of the upper antennæ, the terminal joint less minute.

Mandibles.—The cutting edge on the left mandible with five teeth; the secondary plate with four teeth; the spine-row, I believe, with only three denticulate spines; the molar tubercle prominent, with rounded dentate crown; the palp of great length, the first joint short, the second very long, with only a few spines observed on the front margin, some perhaps on the lower part broken off or not noticed; the third joint a little shorter than the second, with the front and hind margins gently convex, the apex almost pointed, the front margin having a series of long spines beginning near the base, first with two spaced singly, these being followed by seven pairs.

First Gnathopods.—The first joint shorter and very much narrower than the hand, the hind margin more convex than the front; the second joint short, with a group of spines near the apex behind; the third joint with convex front margin produced to a pointed apex upon the wrist, the hind margin convex, with a group of spines where it joins the oblique lower margin; the wrist longer than broad, much shorter and narrower than the hand, but distally much broader than the preceding joints, with a group of spines near the apex of the convex front margin, and three groups along the hind margin; the hand very large, oval, not quite twice as long as broad, with spines at seven points of the front margin, not including any large groups, and about as many groups on the hind margin, more closely set and containing more spines; the palm curiously

sculptured, at first continuing the hind margin of the hand by the sinuous outer margin of a long tooth, within which three strong spaced palmar spines are set on the surface, the margin itself being pectinate with little spines for some distance; beyond the tooth is a cavity bordered with submarginal spinules, and followed by a smaller tooth leaning rather towards the hinge, and to this succeeds a small cavity and a convex space pectinately fringed and reaching to the hinge of the finger; the finger is strong, curved, with the central part of the inner margin cut into six decurrent teeth; the tip of the nail closes over on the side of the hand among the palmar spines.

Second Gnathopods smaller than the first. The third joint with spines along the distal border, and a group near the front margin; the wrist longer than in the first gnathopods, about as long as the hand, broad, except at the base, with numerous spines at various points of both margins and on the surface; the hand distally wider than the wrist, the front and hind margins convex; a few slender spines at various points of the margins and surface, and three or four strong palmar spines where the hind margin curves round to form the finely pectinate convex palm, over which the finger extends, closely fitting it, with slightly denticulate inner margin.

First Peræopods.—The first joint nearly free from the side-plate, with three little spinules on the slightly sinuous front margin, and one at the apex of the slightly convex hind margin; the second joint with a spinule at the apex of the hind margin; the third joint widening distally, with a spinule above the middle of the straight hind margin, a spinule near the top of the front margin, and a spine a little way below it, the apex rounded; the fourth joint narrower and a little shorter than the third; the fifth joint longer.

Second Peræopods similar to the first.

Third Peræopods.—The first joint very little widened; the third longer than the fourth, scarcely as long as the fifth.

Fourth Peræopods with the joints longer than those of the third; the first with five spinules along the nearly straight front margin, and one or two on the very slightly convex hind margin; the second joint with a spinule at the apex in front; the third joint much longer than the fourth, as long as the fifth, with three spinules standing out from the front margin, a spine at its apex, two spines on the hind margin on the upper half, and a group on the rounded scarcely decurrent apex; the fourth joint with a small spine above the middle of the nearly straight hind margin, and a group at the apex of each margin; the fifth joint with spines at three points behind and four in front; the finger curved, acute, scarcely more than half the length of the fifth joint, the edges smooth.

Fifth Peræopods longer than the fourth, very similar.

Uropods.—Peduncles of the first pair longer than the rami, carrying some marginal spines, and having a spine-process on the lower apex, the outer ramus shorter than the inner, both with marginal and apical spines; the peduncles of the second pair about equal to the inner ramus in length; the outer ramus much shorter and narrower, and

with fewer spines than the inner ramus, which is broad; the peduncles of the third pair broad, longer than the rami, reaching beyond the telson, having some small marginal and apical spines; the rami minute, subequal in length, narrow, and almost acute.

The Telson rather longer than broad, the sides converging below to a not very acute apex; there is a small spine near each lateral margin rather above the centre.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the extremity of the uropods, scarcely a fifth of an inch.

Locality.—Station 241, North Pacific, June 23, 1875; lat. 35° 41′ N.; long. 157° 42′ E.; depth, 2300 fathoms; bottom, red clay; bottom temperature, 35°·1. One specimen.

Remarks.—Beyond the fact of its requiring a new genus for its reception, there is nothing in the character or appearance of the specimen to enhance the probability of its having actually come from so great a depth. That it was thought worthy of exceptional care, or considered to be a specimen of exceptional interest, is implied by its having been mounted during the voyage.

The specific name, derived from the Greek ὀργυιῶν, of the fathoms, refers to the great depth of the ocean at the place where the specimen was obtained.

Family Corophiidæ.

In 1813 Leach instituted the family Corophini for the single genus *Corophium*, but the following year he merged the Corophini in the larger family Podoceridæ. In 1849 Dana established the family Corophidæ for the genera *Cerapodina*, *Cerapus*, *Corophium*, *Podocerus*, *Unciola*, *Atylus*, and *Clydonia;* in 1852 he upheld this family, with the three subfamilies, Clydoninæ, Corophinæ, Icilinæ, assigning to the Clydoninæ only *Clydonia*, to the Icilinæ *Icilius* and *Pterygocera*, to the Corophinæ the genera *Corophium*, *Siphonœcetes*, *Platophium*, *Cyrtophium*, *Unciola*, *Podocerus*, *Cratophium*, *Cerapus*, *Cerapodina*, and *Erichthonius*. Costa in 1857 divided the family Podoceridei into three subfamilies, the Podocerini with the genera *Ericthonius*, *Cerapodina*, *Cerapus*, *Podocerus;* the Unciolini with the genera *Microdeutopus* and *Unciola;* and the Corofiini with the single genus *Corophium*. Spence Bate in the same year adopted the family Corophiidæ with three subfamilies, the Podocerides containing the genera *Pleonexes*, *Amphitoë*, *Sunamphitoë*, *Podocerus*, *Cyrtophium;* the Cerapides with the genera *Ericthonius* and *Siphonocetus;* the Corophiides with the genus *Corophium*. In 1859 Bruzelius assigned to the "Corophidæ, Dana," the genera *Corophium*, *Erichtonius*, *Jassa*, *Podocerus*, *Autonoe*, *Amphithoe*. In 1862 Spence Bate accepted the limits of the Corophiidæ, which Dana had assigned them in 1852, but he omitted *Pterygocera* and included the genera *Amphithoë*, *Sunamphithoë*, *Dercothoe*, *Nænia*, *Cratippus*, *Dryope*,

besides uniting *Platophium* and *Cyrtophium*, *Cratophium* and *Podocerus*, *Erichthonius*, *Cerapodina* and *Cerapus*; to the subfamily Corophiides he gave the genera *Cyrtophium*, *Cratippus*, *Dryope*, *Unciola*, *Corophium*, *Clydonia*, *Icilius*. The definition of the subfamily Corophiides by Bate and Westwood is given in the British Sessile-eyed Crustacea, vol. i. p. 478 (1862), although the name Podocerides is given by an accidental error at the head of several of the following pages. In 1870 Boeck made the Corophinæ the twenty-third[1] subfamily of the Gammaridæ, placing in it the genera *Corophium*, *Siphonœcetus*, *Glauconome*, *Hela*. In 1872–1876 Boeck made the Corophidæ the eighth family of the Gammarina, with two subfamilies, the Corophinæ for the genera *Corophium*, *Siphonœcetes*, *Glauconome*, and the Helainæ for the single genus *Hela*.

In 1880 Nebeski gives to the "Corophiiden" two subfamilies, 1. the Podocerinæ, containing *Amphithoe*, *Podocerus*, *Microdeutopus*, *Microprotopus*, *Cerapus*, and by implication *Ericthonius*; 2. The Corophinæ, with the single genus *Corophium*. Of the family he gives the following account:—

"The Crustacea that belong to this family form a group sharply defined, as well morphologically as biologically. They are in general characterised by having the body little compressed laterally, by the powerful lower antennæ, in which the peduncle has joints of considerable strength and generally far surpasses the flagellum in length; a further very important character lies in the possession of the glandular apparatus in the third and fourth thoracal-limbs [first and second peræopods], of which the finger is always perforated, affording an exit for the secretion." On the ground of the absence of this last character he excludes the genus *Cyrtophium*, as represented by *Cyrtophium darwinii*, Spence Bate, from the Corophiidæ, and suggests its transference to the Dulichiidæ.

In the same year S. I. Smith instituted the subfamily Cerapinæ, of which the definition has been already quoted, see Note on S. I. Smith, 1880 (p. 522). In this he placed the single genus *Cerapus*, giving notes at the same time upon *Ericthonius* and *Unciola*, but without stating what subfamily he thinks they ought to stand in.

Carus in 1885 adopts the family "Corophiidæ, Dana" for two subfamilies, the "Corophinæ (Dana) Cls.," with the genera *Cratippus*, *Corophium*, *Icridium*, and the "Podocerinæ, Cls.," with the genera *Cerapus*, *Microdeutopus*, *Microprotopus*, *Podocerus*, *Grubia*, *Amphithoe*. The arrangement by Gerstaecker in 1886 has been already explained; see Note on Gerstaecker 1886 (p. 580).

In 1882 G. O. Sars, dropping all subfamilies, places in the family Corophiidæ the genera *Corophium*, *Siphonœcetes*, *Cerapus*, *Unciola*, *Helella* [*Neohela*].

[1] In Boeck's work it is numbered "XXII.," the error arising from the circumstance that he gives the same number "XVI." both to the Ampeliscinæ and to the Leptocheirinæ, and numbers the subfamilies consecutively from the Leptocheirinæ onwards.

The definition which Boeck gave of the Corophidæ in 1876 is as follows :—

"*Mandibles* with the palp generally three-jointed.

"*First Maxillæ* with the inner plate small or obsolete ; the palp two-jointed, apically armed with teeth, rarely with slender spines (setis).

"*Second Maxillæ* more or less broad.

"*Maxillipeds* with the outer plate armed on the inner margin with teeth or short spines ; the last joint of the palp apically furnished with spines or unguiform.

"The body depressed ; the side plates very small.

"*Third Uropods* uniramous."

The subfamily Corophinæ he defines as follows :—

"*Upper Lip* broad, apically rounded, and setose.

"*Mandibles* strong, apically dentate ; the secondary plate also dentate ; [the molar tubercle strong and prominent][1] and the lower series of teeth ending in a long plumose seta ; the spine-row composed of few, but broad, apically dentate, spines ; the palp three- or two-jointed.

"*Lower Lip* broad, the inner plates strong.

"*First Maxillæ* having the palp apically armed with strong teeth ; the inner plate small or obsolete.

"*Second Maxillæ* more or less broad.

"*Maxillipeds* broad, strong ; the outer plate armed on the inner margin with teeth or spines ; the fourth joint of the palp apically furnished with two strong spines or unguiform.

"*The Body* depressed, broad, robust ; the side-plates small, rigid.

"*The Head* dilated.

"*Lower Antennæ* generally stronger than the *Upper*, pediform, apically furnished with curved spines (unguibus), in the male very robust.

"*Second Gnathopods* generally stronger than the *First*.

"*Pleopods* short, strong ; the peduncle sometimes on the inner side strongly dilated.

"*First* and *Second Uropods* biramous ; the rami little elongate.

"*Third Uropods* small, short, broad, uniramous.

"*Telson* laminar."

To include *Cerapus*, this definition will require to be modified by saying that the *Maxillipeds* are *generally* broad, and that the *Second Uropods* are sometimes *uniramous*.

[1] There is no equivalent for the bracketed words in either of Boeck's works, but as the definitions have evidently been copied into the larger work from the smaller and earlier one, the repetition of mistakes after the author's death is not to be wondered at ; the accounts of various species will, I think, justify the mode above adopted of filling up an obvious hiatus.

Genus *Cerapus*, Say, 1817.

1817. *Cerapus*, Say, Journ. Acad. Nat. Sci. Philad., vol. i. pt. i. p. 49.
1823. „ Desmarest, Dict. d. Sci. Nat., t. xxviii. p. 358 (S. I. Smith).
1825. „ Desmarest, Consid. gén. sur la classe des Crustacés, p. 271.
1829. „ Latreille, Le Règne Animal, t. iv. p. 122.
1830. „ Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 383 (extr. p. 32).
1836. „ Templeton, Trans. Entom. Soc. Lond., vol. i. pt. iii.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ (*pars*), Milne-Edwards, Hist. des Crust., t. iii. p. 60.
1840. *Cerapodina*, Milne-Edwards, Hist. des Crust., t. iii. p. 62.
1843.[1] *Cerapus*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 494 (footnote).
1849. *Cerapodina*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. p. 139.
1849. *Cerapus*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. p. 139.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. p. 309; U.S. Explor. Exped., p. 832.
1852. *Cerapodina*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. p. 309; U.S. Explor. Exped., p. 832.
1857. *Cerapus* (*pars*), White, Popular History of British Crustacea, p. 189.
1862. „ (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 262.
1862. *Siphonœcetes* (*pars*), Bate and Westwood, Brit. Sess. Crust., vol. i. p. 469.
1874. *Cerapus* (*pars*), S. I. Smith, Invert. Anim. Vineyard Sound, p. 565 (271).
1880. „ S. I. Smith, Trans. Connect. Acad., vol. iv. p. 277.
1882. „ Sars, Oversigt af Norges Crustaceer, pp. 31, 113.
1885. „ (*pars*), Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 393.
1885. *Cyrtophium*, Giles, Journ. Asiatic Soc. Bengal, vol. 54, pt. ii. p. 55.

For original definition of the genus, see Note on Say, 1817 (p. 100). Boeck's definition is inapplicable, being based in fact on species of the neighbouring genus *Ericthonius*, Milne-Edwards. In connection with those already given for the family (and subfamily), the following characters may suffice for the genus:—

Mandibles with the third joint of the palp nearly or quite equal in length to the second.

First Maxillæ with the inner plate small.

Maxillipeds with the palp elongate, having its fourth joint armed with an ungual spine.

Antennæ subequal in length, both pairs stout, with short flagella.

Second Gnathopods in the male much stronger than the *First*, having the wrist much larger than the hand.

First and *Second Peræopods* with the first joint much dilated.

Third and *Fourth Peræopods* with the terminal joints reversed.

Pleopods without cleft spines on the first joint of the inner ramus.

Second Uropods uniramous.

Telson bilobed.

[1] The genus *Lusyta*, Nardo, 1847 (see Note on Nardo, 1869, p. 390), is probably a synonym of *Ericthonius* rather than of *Cerapus*.

Cerapus sismithi, n. sp. (Pl. CXXIV.).

The Rostrum is acute, curving slightly downwards, prolonged beyond the small lateral lobes of the head, which viewed from above appear to be acute, but are in fact a little rounded; the sides of the head emarginate behind the lateral lobes for the lower antennæ; the back round, widening a little from the head to the third peræon-segment, the pleon-segments narrowing successively to the telson.

The Eyes small, round, situated on the lateral lobes of the head.

Upper Antennæ a little shorter than the lower. The first joint larger, longer, and much broader than the second or third, distally produced both above and below, below into a pointed apex, above in a larger rounded process carrying some setules; there are also some small spines and setules on and near the lower process; the joint is broadest where the processes begin; the second joint is broader than the third and a little longer, with a small apical pointed process, the lower margin convex, carrying four groups of spines, some of them long; the upper margin has four or five setules; the third joint with setules on the upper margin and five groups of spines on the lower, the apical especially very long; the flagellum of five joints, together not equal to the second and third of the peduncle, all armed with groups of spines and cylinders, the first joint having three groups on its under margin.

Lower Antennæ.—The first and second joints very short, the gland-cone inconspicuous; the third joint a little longer than broad, with straight upper and convex lower margin, carrying some small spines and spinules; the fourth joint nearly as long as the first of the upper antennæ; the fifth joint as long as the fourth but not so broad, the two armed nearly as the second and third in the upper antennæ; the flagellum of four joints tipped with strong spines, and also carrying groups of setæ or very slender spines; the four together longer than the fifth joint of the peduncle.

Upper Lip.—The distal margin evenly rounded.

Mandibles.—The cutting edge divided into four or five unequal teeth; the secondary plate on the left mandible with four teeth, that on the right narrower, with an apical tooth, above which the margin is only slightly denticulate; the spine-row, as seen on the left mandible, of three spines, distally much denticulate and bent backwards; on the right mandible there appear to be only two spines; the molar tubercle a little prominent, with the dentate crown pentagonal or almost circular, but decidedly flattened on one edge which is the most strongly denticulate; on the opposite border there is a little laminar process, narrow at the base and widened distally; there is a small round-headed process near the base of the palp; the first joint of the palp a little longer than broad; the second joint between two and three times as long as the first, with eight or nine spines in five groups in or near the front margin; the third joint very little shorter than the second, distally a little broader, with a long feathered spine at the middle of

the front margin, followed by two pairs of similar spines at intervals, and an apical group of eight; just above the centre of the hind margin is a single spine, and on the outer surface not far from the base, distant from either margin, two very long spines are planted (shown in the figure, as seen through the transparent joint).

Lower Lip.—Both the principal and inner lobes appear to be very slightly ciliated and distally dehiscent, the principal lobes also with the inner margins wide apart for a considerable distance, and having a notched appearance, as if of incipient jointing, on the outer margin; the mandibular processes rather divergent, the apices rounded.

First Maxillæ.—The inner plate very small, apically narrow, without any trace of setæ that I can perceive (in *Cerapus tubularis*, Say, they are, according to S. I. Smith, tipped with one or two setæ); the outer plate broader at the base than distally, with nine spines on the slightly convex distal margin, four of which have a little denticle below the furcate top, the other five are longer and have several minute lateral denticles; the first joint of the palp short; the second reaching beyond the outer plate, widening a little from the base, with five spine-teeth on the dentate apical margin, and three slender submarginal spines.

Second Maxillæ.—The inner plate shorter and narrower than the outer, with some spaced plumose setæ on the inner margin, beginning beyond the middle of it, near the apex, which has many long spines closely set; the spines are longer and more numerous round the broader apex of the outer plate.

Maxillipeds.—The inner plates not nearly reaching the apex of the palp's first joint, with some setæ on the inner margin, and the subapical spine-tooth, the broad distal margin having three spine-teeth and some slender spines; the outer plates reaching to about the middle of the palp's second joint, the inner margin for some distance smooth, except for the long slender spines which project beyond it from the outer surface, but near the apex having four spine-teeth, followed by four longer spines round the distal margin; the first joint of the palp of average length, with two long slender spines on the short inner margin; the second joint not twice as long as the first, with numerous long spines on its inner margin; the third joint subequal in length to the first, the margins almost parallel, the apical border carrying many long spines; the finger very short, the distal end pointed above, carrying a group of spines, one of which is long and strong, and if reckoned as the nail would make the finger equal in length to the third joint.

First Gnathopods.—Side-plates very small, rather broader above than below, not contiguous with the following pair. The first joint almost entirely free from the side-plate, widening at once from the narrow neck, very little longer than the hand, the hind margin convex, smooth, the front straighter or a little concave, with setules; the second joint short, with an apical seta; the third a little longer than the second, the front and hind margins smooth, slightly convex, the distal margin having an irregular row of long spines planted just above it; the wrist rather shorter than the hand, distally rather wider,

with spines at the apex of the front margin, the hind margin serrate, fringed with about a dozen feathered spines in double row, the surface at a little distance having another series of half-a-dozen spines; the hand narrow at the base and distally, with four groups of spines along the front margin; the hind margin (as distinct from the palm) short and smooth; the greatest breadth of the hand at the beginning of the slightly convex, serrate, finely pectinate palm, which is fringed with feathered spines in three groups of three, followed by half-a-dozen spaced singly; there are a few others on the surface apart from the margin; the finger occupies the apex of the hand, and in length matches the palm, the dorsal cilium close to the base, the inner margin finely pectinate, with three setules at intervals, a decurrent tooth before reaching the nail, and two or three long setules planted at the base of this tooth.

Second Gnathopods.—The side-plates shallow, broader than deep, with a cilium on the front margin. The first joint free from the side-plate except at the narrow neck, then at once attaining its greatest width, the distal width more than half the length; the second joint narrower than the first, but broader than long, with an apical seta; the third joint narrowly oval, longer and narrower than the second, with a few spines on the rounded apex; the wrist of great size, very much broader and longer than the first joint, wide at the base but much wider distally, the front margin sinuous, the hind margin rather longer than the front, and where free from the third joint slightly crenate, with about five small groups of spines, ending in a strong dental process, between which and the apex of the front margin its distal margin is as long as the front margin; of this distal edge rather over a third in front is occupied by the articulation of the hand, the remainder forming a palmar margin, consisting of a large, convex, finely denticulated prominence between two small cavities, within which some slender spines project; there are a few more such spines at points on the surface; the hand is subequal in length to the wrist, but very much narrower, so as to be strap-shaped, but strongly curved, with a little denticulate process on the inner margin close to the hinge, the convex outer margin having a few spinules at intervals, the concave inner margin seemingly sharp-edged and smooth till near the apex, where it carries a row of close-set adpressed teeth or spines, being also fringed throughout with submarginal spinules; the finger is rather less than half the length of the hand, with a tolerably large dorsal cilium near the base, the inner margin smooth except for a decurrent tooth near the base of the nail accompanied by setules, and a group of four setules close together at some little distance from the base.

First Peræopods.—The side-plates rather larger than the preceding pair, forming a separate little lobe in front, armed with a feathered cilium. The branchial vesicles narrowly oval, much shorter and very much narrower than the first joint. The first joint free from the side-plate, nearly as long as the next four united, broad, and occupied with gland-cells; immediately below the narrow neck the front margin is strongly convex, fringed with a few setules and feathered setæ; below it is nearly

straight; the hind margin somewhat more evenly convex, converges to the narrowed distal margin, which is nearly straight, projecting in front beyond the second joint, parallel with a continuation of the hind margin, which crosses the surface just below the neck; near the convex part of the front margin, a curved slit crosses the outer surface of the joint nearly halfway; the second joint longer than broad, with one or two setules on the hind margin; the third joint longer than the fourth, widening distally, with feathered spines at the apex of the convex front, and at three points of the straight hind margin, one at its apex elongate; the fourth joint not longer than the second, with spines at the apex in front, and at two points of the hind margin; the fifth joint subequal in length to the third, narrowing distally, with feathered setæ at the apex of the very convex front margin and a spinule above, and setæ at four points of the straight hind margin; the finger three-quarters the length of the fifth joint, rapidly tapering, curved, with an opening in the apex.

Second Peræopods.—The side-plates with a front lobe as in the preceding pair. The branchial vesicles larger than in the preceding pair. The first joint with the front margin evenly convex, making the plate more regularly oval than in the first peræopods, less broad above but equally long; in this pair the third joint is nearly as long as the fourth and fifth united, and the fourth is quite as long as the fifth; the limb otherwise nearly as in the preceding pair.

Third Peræopods.—The side-plates much broader than deep, having the convex lower margin of the front lobe bordered with feathered setules, the small and shallow hind lobe having a cilium in a notch of the lower margin. The branchial vesicles much smaller than the preceding pair. The first joint irregularly squared, as broad as long, but rather broader above than below; the second joint broader than long; the third distally as broad as the length, the front margin convex, with small spines at the apex, the hind margin nearly straight, with three strongly plumose spines at the slightly decurrent apex; the short fourth joint almost embedded in the third, than which it is abruptly much narrower, distally broader than long, the hind margin very convex, its rounded apex furred and carrying a feathered seta, the apex in front rounded, carrying two or three setules; the fifth joint almost as long as the third, tending to oval, but with the hind margin almost straight, carrying a small seta above the apex, the front margin convex, smooth, with two setæ at the apex; the finger very short, stout at the base, with a broad sharp nail abruptly upturned behind, there being a small dorsal cilium near the base of this nail, and still nearer two little dorsal teeth.

Fourth Peræopods.—The side-plates not very unlike the preceding pair in outline, but smaller and with smooth edges. The branchial vesicles very small. The first joint narrower and longer than in the preceding pair, more oval than square; the second joint scarcely longer than broad; the third much longer than the fourth, a little widened distally, with a setule at the apex of the almost straight hind margin, one at the middle

of the slightly convex front margin, and some setæ at its apex; the fourth joint a very little longer than broad, with long feathered spines or setæ at the apices; the fifth joint as long as the third, resembling the fifth joint in the preceding pair, but longer, and its finger having a longer nail.

Fifth Peræopods.—The side-plates apparently smaller than in the preceding pair. Branchial vesicles perhaps not present. The first joint a little longer and more pyriform than in the fourth peræopods, the front margin nearly straight; the second joint longer than broad; the third, fourth, and fifth all longer than in the preceding pair, the fifth having the hind margin convex and the front straight, instead of reversed as in the two preceding pairs, the two margins, however, being nearly parallel; the finger with the upturned point in front.

Pleopods.—The coupling spines small and slender, the apical and a second pair of retroverted hooks being close together and sharp; there do not appear to be any cleft spines; in the first pair the joints of the inner ramus are seven or eight in number, of the outer nine, the first of the outer being much more expanded than that of the companion ramus and fringed on the outer margin with many long feathered setæ; the other two pairs were not observed with precision, but were successively smaller, as in the next species.

Uropods.—The peduncles of the first pair longer than the rami, with a few slender spines along the distal half of the upper outer margin, the distal margin pectinate; the outer ramus longer than the inner, with eight or nine setiform spines within the slightly curved outer margin, which is also bordered with rows of little tooth-like spines; there is a strong spine at the rounded pectinate apex; the shorter inner ramus appears to have both lateral margins smooth, the apex as in the outer ramus; the peduncles of the second pair do not reach so far as those of the first, but are longer than the single ramus, of which the inner margin is smooth, nearly straight, the outer convex, fringed to some extent like the outer ramus of the first pair, the apex blunt, not pectinate, carrying a setiform spine; the short broad peduncles of the third pair begin about on a level with the apices of those of the other pairs and extend beyond the telson; they have the inner margin convex, carrying a setule, the outer tending to concave, armed with two setules; the ramus is minute, only just projecting beyond the peduncle, with two upturned sharp spine-teeth and a little tooth behind each.

The Telson is very short, broader than long, bilobed, with a girdle round the middle of about fifty little spine-teeth.

Length.—The specimen, in the position figured, measured, from the rostrum to the back of the seventh peræon-segment, a little over one-tenth of an inch.

Locality.—The specimen, evidently a male, was obtained at Kerguelen Island, Station 149 H, off Cumberland Bay, Jan. 29, 1874; depth, 120 fathoms; bottom, volcanic mud. There are two other specimens in little cylindrical tubes of sand, one with the head and

antennæ protruding. This is represented in the Plate, fig. A, natural size. The case has two or three little warty excrescences of sand upon it, and an empty Globigerina shell.

Remarks.—The specific name is given in compliment to S. I. Smith, Esq., who has redescribed *Cerapus tubularis*, Say, in a very important paper. See Note on S. I. Smith, 1880 (p. 522). I ought to mention that the separate figures of the gnathopods in the Plate were drawn with the A eye-piece of my microscope, and those of the peræopods with the B eye-piece, so that in these figures the peræopods are on a larger scale than the gnathopods.

Cerapus flindersi, n. sp. (Pl. CXXV.).

The Head with a small, sharp, carinate, slightly depressed rostrum; the lateral lobes of the head well advanced, apically a little rounded, the head emarginate below and a little behind the lobes; the first two segments of the peræon very short, together not as long as the head, the next three segments very long, especially the third of them; the pleon tapering distally, the postero-lateral angles of the third segment acute.

The Eyes round oval, situate on the lateral lobes, retaining a dark colour in the specimen preserved in spirits.

Upper Antennæ grooved on the under side for the reception of the dilated fourth joint of the lower antennæ. The first joint winged near the base, much longer than the second joint, the upper margin convex, the opposite margin below the wing straight, with four groups of long spines; the second joint with the margins slightly convex, some spinules on the upper, six groups of long spines on the lower; the third joint with straight margins, narrower than the second, as long as the first, with spinules above, and on the lower margin two groups of short and seven of long spines; the flagellum of four joints, the first the longest, the four together equal in length to the third joint of the peduncle, all carrying cylinders and strong denticulate spines.

Lower Antennæ subequal in length to the upper. The first two joints very short, gland-cone very small; the third joint a little longer than broad, the upper margin convex, some spinules and spines distributed at various points, chiefly on the distal margin; the fourth joint dilated at the base, abruptly broader than the preceding joint, subequal in length to the third joint of the upper antennæ and thicker, with several groups of long spines planted near the upper margin and some groups of spines and some spinules near the lower margin; the fifth joint longer and more slender, narrowing a little distally, fringed below with several groups of long feathered spines; the flagellum of four joints, the first the longest, the four together a little longer than the last of the peduncle, all carrying denticulate spines, and the last a very strong one, shorter than the rest, with an almost hooked tip.

Upper Lip.—The distal margin evenly convex, with a small piece at the centre smooth, between two tracts that are finely furred.

Mandibles.—The cutting edge divided into five teeth; the secondary plate on the left mandible having four strong teeth, on the right mandible having an oblique irregularly denticulate margin, with a small tooth at the upper, and a more prominent one at the lower, end; the spine-row of two broad spines distally tapering and strongly denticulate and feathered; the molar tubercle prominent; on one edge of the dentate crown on the right mandible were seen eleven teeth very distinct, not crowded, at one corner a long plumose seta, and on the opposite side a small oval denticulate excrescence, corresponding to the laminar process already noticed in some other species; the first joint of the palp a little longer than wide, widening distally; the second joint two and a half times as long as the first, with four spines, three of which are on the lower half and very long; the third joint very little shorter than the second, with five long feathered spines on the distal half of the front margin, followed by three on the narrow apex.

Lower Lip.—The principal lobes a little dehiscent, and like the inner lobes not very strongly ciliated; the mandibular processes divergent, rather long and narrow.

First Maxillæ.—The inner plate small, with a long apical seta; the outer plate with ten spines easy to count on the distal margin, whereas in *Cerapus sismithi* there are, I think, certainly only nine; of the ten in the present species five that are longer than the rest have several minute lateral denticles, of the others three have a denticle on the outer side; the second joint of the palp has seven spine-teeth on the distal margin and four submarginal slender spines.

Second Maxillæ.—The setæ of the inner plate do not appear to descend the inner margin so far as in *Cerapus sismithi.*

Maxillipeds.—The inner plates not reaching so far as the distal end of the palp's first joint, with setæ passing from the inner margin across the distal angle, the distal margin broad, with three spine-teeth and several feathered spines, a subapical spine-tooth on the inner margin; the outer plates reaching beyond the middle of the second joint of the palp, having ten spine-teeth on the inner and oblique apical margins, successively longer, the six on the inner margin also successively thicker, the apical four becoming successively thinner; the first joint of the palp more than half the length of the second, its inner margin only half as long as the outer, carrying two spines; the second joint fringed on the inner margin with many long spines; the third joint shorter than the first, the margins nearly parallel, the apical part crowded with long spines; the finger very short, narrowing distally, the ungual spine on the apex rather longer than the basal part, the two together rather longer than the third joint.

First Gnathopods.—Side-plates small, a little broader than long, with two or three spinules at the lower margin. The first joint all but free from the side-plate, much longer than the hand or wrist, widening distally, the front margin concave, fringed with

spinules, the hind margin convex, with a slender spine at the apex; the second joint as broad as long, with a similar spine near the apex; the third very little longer than the second, with some spines on the rounded hind corner, and long ones projecting from the surface on the distal margin; the wrist a little longer and distally a little broader than the hand, the convex front margin smooth, with a group of spines on the apex; the hind margin jutting out when free from the third joint, then straight, serrate, carrying six groups of spines, some strongly denticulate except at the distal part; on the surface at some distance from this margin is a group of two followed by a row of five spines; the convex front margin of the hand has seven groups of long curved spines on or near it; the hind margin juts out a little from the base, but not far enough to bring the slightly convex palm-margin on a level with the hind margin of the wrist; the palm-margin has two little projecting teeth, the distal end serrate, and six or seven groups of spines like those on the wrist; planted on the surface a little remote from the margin, but projecting beyond it, there are three strong spines apart from one another; the finger matches the palm; there is a rather long dorsal cilium near the base, the inner margin almost straight, and at first almost smooth, then becoming more and more strongly pectinate, and forming a strong decurrent tooth near the base of the slightly inflected nail, there being two short and two long setules in the neighbourhood of the tooth.

Second Gnathopods.—The side-plates broader than deep, with some setules in front, much shallower behind than in front. Marsupial plates narrow, shorter than the first joint, having seven long setæ. The first joint expanded on the outer side, with a convex front margin fringed with slender spines and spinules, but the front margin of the unexpanded inner surface resembling that in the first gnathopods; the second joint as in the preceding pair; the third joint rather longer, with some spines of various lengths along the distal part of the convex hind margin, and some short spines on and projecting from the surface beyond the truncate distal margin; the wrist triangular, longer than in the preceding pair, very similar in armature; the hand as long as the wrist, narrowly oval, narrower distally than at the base; the armature very similar to that in the first gnathopods, but the groups more widely spaced; the finger a little longer, its inner margin more curved, denticulate.

First Peræopods.—Side-plates broad and shallow. Branchial vesicles a very elongate oval. Marsupial plates like the preceding pair. First joint of the limb free from the side-plate, very large, packed with gland-cells, longer than the next four joints united, broader above than below, articulated almost at the top of the hind margin, the front squarely and very prominently angled, the sides carrying several marginal spinules, and the angle two or three feathered setæ; the lower margin projects beyond the second joint; a long transverse slit crosses the surface of the joint from the front almost to the rear near the centre; the second joint broader above than below, rather longer than broad, with some spinules at either apex; the third joint shorter than the second,

broader than long, both margins strongly convex, with long apical spines; there is a long spine also on the inner surface near the hind margin, and a longitudinal groove in front of the middle of the outer surface; the fourth joint shorter and narrower than the third, with long feathered spines at each apex; the fifth joint shorter than the second, longer than the third or fourth, with a row of four setiform spines on the slightly concave hind margin, three or four on the rounded apex of the front, with a spinule higher up; the finger more than half as long as the fifth joint, tapering at first abruptly, then gently, with an opening on the tip.

Second Peræopods.—Side-plates very broad and very shallow, with a little front lobe carrying a couple of feathered spines at the lower front corner. The branchial vesicles long oval, broader than the preceding pair, and not much apically narrowed. Marsupial plates like the preceding pairs. The first joint of the same character and size as in the first peræopods, but of different outline, broader below than above, the front margin evenly convex, unangled; the second joint twice as long as broad; the third joint longer than the second, longer than the fourth and fifth united, with some marginal spinules besides the apical spines; the remaining joints much as in the first peræopods.

Third Peræopods.—The side-plates attached to the lower border of the long segment for almost its whole length, forming a small lobe in the rear, but for the most part of considerable and nearly uniform depth, the slightly crenulate margins armed with setæ of moderate length, twenty-four in number, the series beginning about the middle of the front margin and continued nearly to the hinder lobe. From the appearance of this pair of side-plates it may be supposed that they fulfil the function of marsupial plates, dispensing with the necessity for a separate pair of those appendages, and, if this be so, it will help to explain the peculiarity which Professor S. I. Smith has already noticed in regard to the kindred species, *Cerapus tubularis*, in which he says the ovigerous lamellæ are "only three pairs, and these are borne upon the coxæ of the second pair of gnathopods and of the first and second peræopods." In the figure *prp.*3 it is not the proper side-plate of this limb, but the torn and dislocated side-plate of the next segment that appears. The branchial vesicles similar to those of the preceding pair, or a little shorter. The first joint of the limb squared, a little wider above than below, with one or two spines near the apex of the slightly convex front margin and some spinules on the lower curve of the hind margin, which projects beyond the short broad second joint; the third joint is longer than any of the others except the first, and distally nearly as broad as long, the front margin convex, with two little setules near the produced rounded apex, the hind margin sinuous, forming with its rounded apex a narrow lobe produced more than the front, tipped with four very long plumose setæ, and a spinule; the fourth joint is almost embedded in the third, none of the short front margin free, the hind margin convex, thickly furred with adpressed cilia and tiny spines, the rounded decurrent apex carrying a single feathered spine; the fifth joint

almost oval, a little longer than the fourth, the convex front margin having a very slender spine and spinule at the apex, the less convex hind margin having two slender spines; the finger very short at the base, as broad as long, but abruptly narrowing before reaching the sharp upturned nail, with a hair in the cavity; there is a sharp dorsal tooth preceding the base of the nail.

Fourth Peræopods.—The side-plates broad and comparatively deep, except at the extremities, the lower margin strongly ciliated. The branchial vesicles, if rightly observed, very small and narrow, bent at the base. The first joint attached near the end of the side-plate, oval, but with the front margin flattened; this has nine setules in a series, the hind margin has six more scattered; the second joint short; the third longer than the fourth, with three setules on the slightly convex front margin and one at the apex of the straight hind margin; the fourth joint not much longer than distally broad, with a spinule or two at the apex of the convex front, and a long thin spine at that of the straight hind margin; the fifth joint subequal in length to the third, with a group of slender spines on the apex of the convex front, and two on the lower part of the straight hind margin, which has also a little short apical spine; the finger as in the preceding pair.

Fifth Peræopods.—The side-plates much smaller than in the preceding pair, with the lower margin smooth and nearly straight. The first joint a little longer and more pyriform than in the fourth peræopods; the third a good deal longer, widening a little distally, the margins nearly straight, both with long apical spines, the front also with spinules at three points; the fourth joint also widening distally, much longer than broad, with the front margin a little convex, and a group of long spines at each apex; the fifth joint shorter than the third, very little longer than the fourth, with a group of several long slender spines at the apex of the convex front margin, which has two groups higher up, the almost straight hind margin and the finger much as in the preceding pair.

Pleopods.—On the peduncles of the first pair there appear to be four very small coupling spines, each with an apical pair of hooks, but on the second pair only two spines were perceived; no cleft spines were discovered; in the first pair each ramus has nine joints, the first of the outer ramus much expanded and fringed on the outer side with more then twenty plumose setæ; in the second and much shorter pair, the outer ramus has four joints, the first expanded, with a dozen setæ on the outer margin; the inner ramus has but one joint, shorter and much narrower than the first of the outer ramus; the third pair is much shorter than the second, the outer ramus two-jointed, the first joint expanded, with eleven setæ on the outer margin; the inner ramus rudimentary or (?) absent.

Uropods.—The peduncles of the first pair a little longer than the outer ramus, which has the outer margin fringed with little denticles and also with about a dozen setules, the apex finely pectinate, carrying a large spine; the inner ramus shorter and narrower, with a similar apex, the margins smooth; the second pair with the peduncles much longer

than the ramus, which is minute, little longer than broad, with a cleft apex carrying a feathered setule; the third pair similar to the second, the peduncles rather shorter, with some marginal setules, the ramus not longer than broad, scarcely appearing beyond the peduncle, ending in upturned sharp teeth.

The Telson very short, not longer than broad, in a lateral view appearing to have the apical border set round with two rows of sharp upturned teeth.

Length.—The specimen, in the position figured, measured, from the rostrum to the end of the first or second segment of the pleon, less than one-fifth of an inch.

Locality.—The single specimen, a female, was obtained in Flinders Passage.

Remark.—The specific name is taken from the place of capture.

Genus *Unciola*, Say, 1818.

1818. *Unciola*, Say, Journ. Acad. Nat. Sci. Philad., vol. i. pt. ii. p. 388.
1830. „ Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 382, 383 (extr. 31, 32).
1838. *Unciata*, Milne-Edwards, Hist. Nat. anim. sans vertèbres, t. v.
1840. *Unciola*, Milne-Edwards, Hist. Nat. Crust., t. iii. p. 69.
1845. *Glauconome*, Krøyer, Naturh. Tidsskr., R. 2, Bd. i. p. 501.
1849. *Unciola*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. p. 139.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. p. 309.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 832, 1441.
1859. *Cyrthophium*, Danielssen, Nyt Mag. for Naturv., Bd. 11, Hfte 1, p. 8 (Boeck).
1862. *Unciola*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 278.
1865. *Glauconome*, Goës, Crust. amph. maris Spetsb., p. 17.
1867. *Unciola*, Norman, Nat. Hist. Trans. Northd. and Durham.
1868. *Unciola*, Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 517.
1870. *Glauconome*, Boeck, Crust. amph. bor. et arct., p. 178 (258).
1874. *Unciola*, Verrill and Smith, Invert. Anim. Vineyard Sound, pp. 440, 567, (46, 273)
1876. *Glauconome*, Boeck, De. Skand. og Arkt. Amph., p. 636.
1876. „ Sars, Prodr. descr. Crust. et Pycn. Exp. Norv., p. 360.
1879. „ Sars, Crust. et Pycn. nova, p. 462.
1880. *Unciola*, S. I. Smith, Trans. Connect. Acad., vol. iv. p. 280.
1882. „ Sars, Oversigt af Norges Crustaceer, pp. 31, 114.
1885. „ Sars, Den norske Nordhavs-Exp., p. 212.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.

For the orginal definition of the genus, see Note on Say, 1818 (p. 104). For the definition of *Glauconome*, see Note on Krøyer, 1845 (p. 212). *Unciata*, Milne-Edwards, 1838, is a mere misprint, and *Cyrthophium*, Danielssen, 1859, is only a name, the identification of which with *Glauconome* rests upon Boeck's authority. Boeck gives the following definition of the genus :—

"*Mandibles* with three-jointed palp; the third joint elongate, narrow, but shorter than the second.

"*First Maxillæ* with the inner plate small.

"*Maxillipeds* with the outer plate small, furnished on the inner margin with few but strong teeth; the inner plate broad; the last joint of the palp almost unguiform.

"*Upper Antennæ* only a little longer than the *Lower;* the flagellum multiarticulate; the accessory flagellum small.

"*Lower Antennæ* in the male much stronger than in the female, almost pediform; flagellum of several joints, its last joint armed with two curved spines.

"*First Gnathopods* strong; the hand subcheliform.

"*Second Gnathopods* much slighter and narrower than the first; the hand not to any great extent subcheliform.

"*First* and *Second Peræopods* slightly built.

"*Fourth Peræopods* longer than the *Third, Fifth* than the *Fourth;* the first joint in these three pairs little dilated.

"*Third Uropods* uniramous; the peduncle dilated on the inner side.

"*Telson* laminar."

Unciola irrorata, Say (Pl. CXXXVIII. C).

1818. *Unciola irrorata*, Say, Journ. Acad. Nat. Sci. Philad., vol. i. pt. ii. p. 389.
1840. „ „ Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 69.
1845. *Glauconome leucopis*, Krøyer, Naturh. Tidsskr., R. 2, Bd. i. p. 491, pl. vii. fig. 2.
1846. „ „ Krøyer, Voy. en Skand., pl. xix. fig. 1.
1847. *Unciola irrorata*, White, List of Crust. in Brit. Mus., p. 90.
1854. „ „ Stimpson, Marine Invertebrata of Grand Manan, p. 45.
1859. *Cyrthophium Darwini*, Danielssen, Nyt. Mag. for Naturv., Bd. 11, Hfte 1, p. 8 (Boeck).
1862. *Unciola irrorata*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 279.
1862. *Unciola leucopes*, Sp. Bate, Brit. Mus. Catal. Amph. Crust., p. 279, pl. xlvii. fig. 3.
1865. *Glauconome leucopis*, Goës, Crust. amph. maris Spetsb., p. 17.
1870. „ „ Boeck, Crust. amph. bor. et arct., p. 179 (259).
1874. *Unciola irrorata*, Verrill and Smith, Invert. Anim. Vineyard Sound, pp. 340, 567 (46, 273), &c., pl. iv. fig. 19.
1876. *Glauconome leucopis*, Boeck, De Skand. og Arkt. Amph., p. 636.
1876. „ „ G. O. Sars, Prodromus descr. Crust. et Pycn. Exp. Norv., p. 360.
1876. „ „ Norman, Proc. Roy. Soc. Lond., vol. xxv. p. 208 (S. I. Smith).
1880. *Unciola irrorata*, S. I. Smith, Trans. Connect. Acad., vol. iv. p. 281.
1882. „ „ Sars, Oversigt af Norges Crustaceer, p. 114.
1887. „ „ Hansen, Oversigt Dijmphna-Togtet inds. Krebsdyr.

Maxillipeds.—Besides the three spine-teeth on the distal margin of the inner plates, there is near the apex of the inner margin a more than usually prominent bent spine-tooth; on the broad outer plates the inner margin at the distal part has six spine-teeth, while the apical margin has nine spines, of which the outer six are very slender and much curved; the nail or ungual spine of the palp is very nearly as long as the narrow finger, from which it projects, and at the apex of which there are two or three setules or

slender spines, which lie alongside of the much stronger ungual spine, not in agreement with the latter part of Boeck's account, that "the fourth joint is very narrow towards the end and furnished with *two* strong spines."

First Gnathopods.—Second joint very short, broader than long; with slender spines at the hinder apex; third joint narrowing distally, longer than broad, having an acute front apex resting on the wrist, slender spines at four points of the hind margin and some small groups on the inner surface; wrist not much longer than the third joint, broader than long, distally cup-like, with spines on and near the short projecting hind margin; the hand large, longer than broad, the front margin convex, with some groups of slender spines near it, the hind margin scarcely half the length of the front, strongly serrate, with three powerful spine-teeth in the notches; the palm long, oblique, sinuous, commencing with a rounded tooth, within which is planted a small palmar spine; the finger long and broad, the narrowed apex reaching beyond the palm to the second spine-tooth of the hind margin, much of its inner margin strongly denticulate, its outer margin carrying six transverse rows of very long pectinate spines. Of these conspicuous ornaments of the finger, Say makes no mention, but it is more curious that Boeck also leaves them unnoticed, although for his own two species, *Glauconome krøyeri* and *Glauconome steenstrupii* he mentions spines on the hind margin of this finger. Krøyer in his description emphatically remarks that "*the finger shows the altogether unusual circumstance of being furnished on the front side with a number of long coarse close-set bristles.*"[1]

Pleopods.—The peduncles (in the pair examined) much shorter than the rami, ciliated, and carrying a few slender plumose setæ; the coupling spines rather large, broad at the base, bent, with four retroverted teeth in a series below the minute one at the apex; the inner ramus longer than the outer,[2] the first joint not very long, much dilated on the outer side, on which distally it carries three setæ, on the inner margin armed with five graduated cleft spines, the lowest the longest, the longer arm strongly serrate on the inner margin, the shorter widened just before the apex and then sharply pointed; the joints of the inner ramus eighteen in number, the outer ramus with an interlocking process at the base of the first joint, its outer margin dilated, carrying seven or eight flattened setæ, the joints seventeen in number, the feathered setæ on both rami long and strong.

Uropods.—The angle of the fourth pleon-segment is produced with a strongly serrate margin far along the side of the peduncles of the first pair of uropods; these peduncles are much longer than the rami; the inner ramus is a little shorter than the outer; the second uropods are much smaller than the first with less difference in length between the peduncles and the rami, but the peduncles are longer than the rami, the inner ramus a little shorter than the outer; the third uropods very small, the peduncle

[1] Naturh. Tidsskr., R. 2, Bd. i. p. 497.
[2] Krøyer says, "the outer little longer than the inner."

produced on the inner side almost to the apex of the outer ramus, the inner ramus being absent, unless we may suppose that it is in fact coalescent with the peduncle and represented by the produced portion of the peduncle.

Telson nearly circular, apically a little angled.

Locality.—Station 49, south of Halifax, Nova Scotia, May 20, 1873; lat. 43° 3′ N., long. 63° 39′ W.; depth, 85 fathoms; bottom, gravel, stones; bottom temperature, 35°. One specimen, female.

Incertæ Sedis.

Genus *Haplocheira*, Haswell, 1880.

1880. *Haplocheira*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 273.
1880. „ Haswell, Ann. and Mag. Nat. Hist., ser. 5, vol. v., January.
1882. „ Haswell, Catal. Australian Crustacea, p. 269.
1884. *Corophium*, Chilton, Trans. New Zealand Inst., vol. xvi. p. 262.
1885. *Haplocheira*, Haswell. Proc. Linn. Soc. N.S.W., vol. x. pt. iv. p. 273 (extr. p. 12).
1886. *Corophium* (*pars*), Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 143.

For the original definition of the genus, see Note on Haswell, 1880 (p. 512), and for a supplementary account see Note on Haswell, 1885 (p. 565). The type-species had been described by Mr. G. M. Thomson in 1879 as *Gammarus barbimanus*. It was again described by Mr. Chilton in 1884 as *Corophium lendenfeldi*. The following definition is offered for comparison with those of neighbouring genera:—

Mandibles with cutting edge and secondary plate dentate; spine-row of numerous denticulate spines; molar tubercle large and prominent; palp three-jointed, the second joint the longest.

First Maxillæ with the inner plate rather large, carrying many plumose setæ; nine spines on the outer plate.

Second Maxillæ having a long fringe of setæ on the inner side of the inner plate.

Maxillipeds with the inner plates broad, the outer plates not larger than the inner, the palp elongate, the finger not unguiculate, tipped with a very long spine.

Antennæ subequal; the upper antennæ with a small accessory flagellum.

First Gnathopods not subchelate, the hand and finger long and slender.

Second Gnathopods not subchelate, the wrist and hand long and slender.

First and *Second Peræopods* with gland-cells in the first and third joints, the finger perforated.

Fourth Peræopods longer than the *Third*, *Fifth* than the *Fourth*; the first joint expanded in all three pairs.

All three pairs of *Uropods* biramous, the rami in the first two pairs not very unequal; the third pair with short and stout peduncles, the inner ramus minute, much smaller than the outer.

Telson tending to circular, not reaching the apex of the peduncles of the third uropods, having a small hook at each corner of the distal margin.

Body little compressed.

By the habit of body this and the following genus appear to belong to the Corophiidæ, but they are excluded from that family as defined by Boeck through having the third uropods biramous. From the Photidæ and Podoceridæ *Haplocheira* is removed by the gnathopods, of which neither pair is subchelate.

Haplocheira plumosa, n. sp. (Pl. CXXVI.).

Body little compressed, narrowing from the third or fourth segment of the peræon; the rostrum small, acute, the lateral lobes of the head triangular, produced considerably beyond the rostrum, acute; the segments of the peræon short, the first three of the pleon successively longer, the third segment having the lower margin straight, long, equipped with some submarginal setæ, the postero-lateral angles rounded, having a cilium in a little notch.

The Eyes small, oval, advanced into the lateral lobes of the head, with about thirty ocelli, retaining dark colour in spirits.

Upper Antennæ.—The peduncle longer than the flagellum, not so long as the peduncle of the lower antennæ; the first joint about as long as the head, as long as the second and broader, with a group of tolerably stout spines and a slender one at the lower apex, also a spine near the middle of the lower margin; the second joint with some small spines; the third half the length of the second, and thinner; the flagellum of nine or ten joints, together as long as the second and third of the peduncle, equipped with cylinders; the secondary flagellum, apparently broken, showing one narrow joint, not tapering, not so long as the first of the primary.

Lower Antennæ slightly longer than the upper. The first two joints short, but the gland-cone rather long, decurrent, acute; the third joint stout, scarcely longer than the second including the produced gland-cone, with one or two spines on the convex upper margin, a slender spine and spinules on the lower; the fourth joint a little curved, longer than the first joint of the upper antennæ, carrying a few slender spines; the fifth joint shorter and thinner than the fourth, almost as long as the first of the upper antennæ; the flagellum of five joints, together not quite so long as the fifth joint of the peduncle, the last joint minute, tipped with slender spines, the other four having each two groups of spines, including one or more strong ones.

Upper Lip.—The distal border with a very slight unsymmetrical emargination, the tract on either side of which is slightly ciliated.

Mandibles.—The trunk broad, the cutting edge not very elongate, with four very unequal teeth; the secondary plate of the left mandible with two teeth as large as the

largest two of the principal plate, other teeth, if present, not perceived; the secondary plate on the right mandible consisting of a single long tooth, denticles on the upper edge perhaps worn down, none visible; the spine-row of eight long, closely set, backward-curved, denticulate spines, widening from the base for two-thirds of the length; the molar tubercle large and prominent, the crown not strongly dentate, with one edge smooth; there is a small rounded process above the molar tubercle at some distance behind the base of the palp; the palp set very much forward; the first joint longer than broad, with two spines standing out from the distal part of the front margin; the second joint long, slightly curved, nearly three times as long as the first, with eleven long spines standing out from the inner margin, and nine smaller spines placed along the surface; the third joint rather more than half the length of the second, with several groups of long spines planted on the surface; the narrowly rounded apex, the distal part of the convex outer margin, and most of the straight inner margin, also carrying spines.

Lower Lip rather compact; the principal lobes broadly rounded, the inner margins dehiscent; the inner lobes distally flatly rounded; the mandibular processes short and broad, little prominent, and not divergent; a kind of ridge runs from the inner margin of these processes to the middle of the distal margin of the principal lobes.

First Maxillæ.—The inner plate fringed along the inner margin with twelve plumose setæ; the outer plate much curved, with nine spines on the truncate distal margin, of which six have several minute denticles on the inner edge, while three have a single more prominent denticle on the outer side; in the figure *mx.*1., only eight spines are shown, one having been accidentally broken off in the specimen; the first joint of the palp very short, the second long, widening a little distally, reaching beyond the outer plate, carrying six spine-teeth on the dentate apical border, and about ten slender spines distributed on the surface from the inner margin towards the outer apex.

Second Maxillæ.—The inner plate wider below than above, with a series of eighteen long plumose setæ beginning at some little distance from the base of the inner margin, and curving away from it below the apex; at the middle of the margin begins a row of long spines, which nearer the apex are supplemented by short ones, neither row descending the outer slope of the apex; this plate and conspicuously its inner and apical margins are strongly furred; the outer plate is very little longer than the inner, widening slightly at the apical margin, which is broader than that of the inner plates and fringed with long spines.

Maxillipeds.—The inner prismatic plates reaching about to the apex of the first joint of the palp, with plumose setæ passing from the upper part of the inner margin across the inner corner, the broad distal margin sinuous, serrate at the outer part and carrying five setiform feathered spines, the inner part excavate, and having a slender spine-tooth at the apex of the inner margin, a broad spine-tooth next to this, and then another slender one; the outer plates narrow, not reaching the middle of the palp's second joint,

apically narrowed, having numerous long spines on both surfaces but especially on the outer surface, with apparently only one spine that could be properly designated a spine-tooth, and even that a slender one, just below the apex; the distally serrate outer margin carrying four very long spines; the spines on the outer surface of the bases of both the inner and outer plates form long and striking series in this species; in the figure it is as usual the inner surface that is shown; the first joint of the palp about half the length of the second, with a long spine on the apex of the short inner margin; the second joint long, not broad, the inner margin crowded with feathered spines; the third joint longer than the first, a little apically produced, with several groups of feathered spines over the surface except near the base, and a long row of pectinate spines only visible when the joint is turned at a particular angle; the finger narrow, rather more than half the length of the third joint, with a dorsal cilium some little way from the hinge, the inner margin distally serrate, with four slender spines and a fifth much longer than the other four; at the apex a still longer and stronger spine, longer than the base of the finger, the equivalent of a nail, not however in a continuous line with the base but at right angles to it.

First Gnathopods.—The side-plates broader below than above, the lower front corner rounded, produced forwards, the convex lower margin carrying a few spinules. The first joint reaching little beyond the side-plates, having four long setæ about the middle of the convex hind margin; the second joint short, with a group of very long spines on the hinder apex; the third joint a little longer than the second, the front and hind margins convex, with long spines at six points of the hind margin, and two groups crossing the inner surface above the oblique distal margin and its acute front apex; the wrist shorter but broader than the hand, twice as long as broad, more than half the length of the hand, with spines at three points of the distal part of the convex front margin, the whole of the slightly convex hind margin densely crowded with feathered spines, an oblique row, in which fourteen spines may be counted, traversing the inner surface; the hand almost as long as the first joint, gently tapering, a small tract at the base of the slightly convex front margin free, the rest, till near the apex, and the apex crowded with long feathered spines, the front margin still more densely set with spines, some here being shorter and stiffer than the prevailing setiform type; at the apex is a palmar spine with an incurved tip, but there is no palm worth speaking of; the finger is about half the length of the hand, with a long dorsal cilium not far from the hinge, the inner margin a little bulging at the base, then pectinate, slightly curved, running out into a tooth, with three unequal setules near its base, the nail beyond this being long, sharp, smooth-edged, more curved than the rest of the finger.

Second Gnathopods.—The side-plates longer than in the preceding pair, the lower part less widened, fringed with slender spines and spinules. The branchial vesicles a long smooth oval, nearly as long as the first joint. The first joint rather larger than in

the first gnathopods; the second joint with a spinule on the hinder apex; the third broad, scarcely longer than broad, with a spinule in the middle of the convex front margin, and a group of unequal spines, the hinder very long, crossing the broad distal margin; the wrist quite as long as the first joint and rather longer than the hand, narrow, of almost even width throughout, the hinder margin a little crenate, fringed with about twenty-four feathered spines that exceed the length of the joint itself, and having an inner similar row, the feathering of the spines long and close; the hand narrower than the wrist, almost as long, tapering, with a row of about fourteen long spines along the hind margin, those nearer the apex shorter than those nearer the base, the inner surface also having numerous groups of very long spines which might project on either margin according to circumstances; the finger about a third of the length of the hand, slender, with the inner margin convex near the base, then very concave, smooth, not running out into a tooth, with cilium and setules as in the first gnathopods. It should be stated that the flexibility of the immensely long spines in these gnathopods would perhaps make it more correct to call them setæ than spines.

First Peræopods.—Side-plates not longer but of more even width than in the preceding pair. Branchial vesicles rather broader than the preceding pair. First joint reaching below the side-plate, packed with three rows of gland-cells, having a few marginal spinules; the second joint short, with a small spine on the hinder apex; the third joint large, widening distally, nearly as long as the first joint, with some small spines at two or three points of the hind margin, spinules at three points of the front, and some slender spines on its slightly decurrent apex; the fourth joint half the length of the third, with spines at the front apex, and at four points of the hind margin; the fifth joint shorter than the third, much longer and thinner than the fourth, tapering, a little curved, with a slender spine near the top of the convex front, a spine or seta at its apex, and spines at six points of the hind margin; the finger narrow, more than half the length of the fifth joint, with a long dorsal cilium near the hinge, and an opening in the tip.

Second Peræopods.—The side-plates rather broader than the preceding pair, the hind margin a little concave. The limb scarcely differs from that of the first peræopods.

Third Peræopods.—The side-plates with a deep front lobe, having a small spine and spinule near together on the rounded lower margin; the shallower hind lobe has on its lower margin a strong backward-curved spine, followed at a little distance by a spinule. The branchial vesicles are smaller than in the preceding segment. The first joint broad, longer than broad, the front margin convex, with small spines at intervals, and on the lower part two groups of larger spines, the hind margin tending to concave, slightly serrate, furnished with spinules; the short second joint with a group of slender feathered spines on the front apex, and a spinule higher up; the third joint longer than the fourth, with slender spines at three or four points in front, and a stout spine at the apex, the hind margin nearly straight, having at the apex two stout spines, one much larger than

the other; the fourth joint not quite twice as long as broad, having a slender curved feathered spine at the apex in front, accompanied by stout spines, and a slender spine and spinule higher up, the hind margin having an apical group, in which the spines are broad and curved, and having also a group of three stout spines on the surface near its centre; the fifth joint narrower, about as long as the third, with four groups of powerful spines along the front margin, and a mixed group at the apex of the hind margin; the finger short, half the length of the fifth joint, much curved, with a long dorsal cilium near the hinge.

Fourth Peræopods.—The side-plates much smaller than the preceding pair. The limb larger and longer than in the preceding pair, but similar; the hind margin of the large first joint slightly convex; the third joint with spines at six points in front and two behind; the fourth joint fully twice as long as broad, with three groups in front and two behind; the fifth joint with five groups of spines on the true front and three on the true hind margin. The fifth and sixth joints in fig. *prp.*4. are reversed, but this is perhaps not their normal position, though no doubt these joints have free play upon the preceding joint.

Fifth Peræopods missing in the specimen described, but present in a second specimen. The side-plates are small. The limb is similar to the preceding pair, but larger; the first joint considerably larger in both dimensions, the front margin slightly convex, with eight small spines spaced along it and an apical group, the hind margin very convex except at the oblique upper part, fringed with small plumose setæ, serrate, the lower margin well rounded, similarly equipped; the third joint fringed in front with feathered spines or setæ, with strong spines at the apex of this and at three points of the hind margin; the fourth joint only a little shorter than the third, with three groups of spines in front and two behind; the fifth joint longer than the third, with five groups of spines in front and three behind; the finger not half the length of the fifth joint.

Pleopods.—The peduncles short and stout, shorter than the rami, the coupling spines slender, a little distally bent, with four teeth on one side and three on the other, and the sharp apex apparently also forming a minute hook; the cleft spines from three to four in a series; the outer ramus shorter than the inner, but the joints appear to be of the same number, eleven, in each.

Uropods.—The peduncles of the first pair much shorter than the rami, with some spines on the upper margins, a small one projecting from near the top of the lower margin, and at the apex of this margin one of great length, which added to the base would make the peduncles longer than the rami; one ramus is rather longer than the other, and has spines at six points of one margin and a group at the blunt apex; the shorter ramus is similar, but with three pairs of spines on the margin and the apical group; the second pair shorter than the first, the peduncles shorter than the rami, also with a very long curved spine on the lower apex, the rami broad, and the spines

stout, the larger ramus with five spines on one border and the apical four, consisting of two large and two small; the shorter ramus has three pairs on the border, and the usual four on the apex; the third pair are very short, the peduncles broad, longer than the rami, reaching beyond the telson, having a few spines on the margins; the outer ramus might be described as a narrow oval, with two strong spines not far below the centre, two just above the apex, and at the apex a group of slender spines, two longer and thinner than the others; the inner ramus also oval, about half the breadth and scarcely half the length of the outer, therefore very small, yet carrying two stout spines, one at the apex and one higher up.

Telson about equal in breadth and length, widest near the base, narrowing only a little to the truncate distal margin, which has a small but strong hook at each corner, turned upwards and backwards, near the base of which are planted some slender spines and spinules, there being also a couple on each margin higher up; the distal margin between the hooks is not absolutely straight, but rather tends to concave in the centre, with a little pimple-like jutting-out of the margin on either side of the very shallow curve.

Length.—The specimen, in the position figured, measured, from the rostrum to the extremity of the uropods, one-quarter of an inch.

Locality.—Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. One specimen.

The specimen from which the fifth peræopod is described was also taken at Kerguelen, depth not mentioned.

Remarks.—The specific name refers to the ornamentation of the gnathopods. Of *Haplocheira typica*, Haswell, I have been enabled to examine a specimen through Mr. Haswell's kindness. Of *Gammarus barbimanus*, Thomson, Mr. G. M. Thomson, not at the time having any but the type-specimen available, very obligingly sent me enlarged figures. Since then in a joint paper Messrs. Thomson and Chilton have identified as one species, under the name *Corophium barbimanum*, *Gammarus barbimanus*, Thomson, *Corophium lendenfeldi*, Chilton, *Haplocheira typica*, Haswell. Mr. Haswell also in a recent paper has expressed the opinion that *Corophium lendenfeldi* is probably the same as *Haplocheira typica*. The genus is distinguished from *Corophium* by many particulars, of which it may suffice to mention the three-jointed mandibular palp, the inner plate of the first maxillæ fringed with setæ, the accessory flagellum of the upper antennæ, the short third joint of the second gnathopods, and the biramous third uropods. The name of the species referred to must therefore be *Haplocheira barbimanus*, Thomson.

Without the opportunity for comparison, one might have easily jumped to the conclusion that the Kerguelen species was specifically identical, as well as generically, with that reported from Australia and New Zealand; but though the resemblances are the

more striking, the differences are numerous. The Kerguelen species is not so *Corophium*-like, the back being less broad; the lower antennæ are less strikingly pediform; the hand of the first gnathopods is distally narrower; at least Mr. Haswell says of his species, "The anterior gnathopods might be described as very imperfectly subcheliform—the propus having a small lobe at the base of the dactylus." In the Kerguelen species the fingers in both pairs of gnathopods are more important, the first peræopods have the third, fourth, and fifth joints more developed in comparison with the first, in the third peræopods the first joint is much less narrowed below, and in the fifth less expanded below, than in the Australian species; in the latter species there is in the peduncles of the pleopods an apical prolongation on the inner side; and the telson, which is wider at the base than the length, has the centre of the distal margin convex instead of concave.

Genus *Camacho*, n. gen.

Mandibles with cutting edge and secondary plate dentate; spine-row of numerous denticulate spines; molar tubercle large and prominent; palp three-jointed, the third shorter than the long second joint.

Lower Lip with both pairs of lobes large; the mandibular processes narrow, divergent.

First Maxillæ with the inner plate small, carrying a single seta; eleven spines on the outer plate.

Second Maxillæ having a long fringe of setæ on the inner side of the inner plate.

The *Maxillipeds* with spine-teeth fringing the inner margin of the outer plates; the finger of the palp having a short ungual spine, so as to appear unguiculate.

Upper Antennæ with the first joint elongate.

The *First* and *Second* pairs of *Gnathopods* similar, elongate, with the wrists long, the hands long-oval, subchelate.

All three pairs of *Uropods* biramous, the rami in the first and second pairs subequal, in the third pair very unequal, the outer not large, but much larger than the minute inner one; the peduncle strongly dilated on the inner side.

The Telson tending to circular, not reaching beyond the peduncles of the third uropods.

The body elongate, little compressed; the side-plates shallow, not close set.

This genus seems to have some affinity with *Haplocheira*, Haswell, the mandibles being in close agreement, and the rami of the third uropods not dissimilar; the widened peduncles of the third uropods recall those of *Siphonœcetes*, Krøyer, but in that genus the third uropods are not biramous.

The generic name is derived from a personage mentioned in Don Quixote.

Camacho bathyplous, n. sp. (Pl. CXXVII.).

The animal elongate, widest at the fourth and fifth segments of the peræon, lateral compression beginning with the pleon; the rostrum minute, pointed; the lateral lobes of the head very small, also acute, the sides emarginate below them for the bases of the lower antennæ; there is a groove on each side of the head near the hind margin; the last five segments of the peræon and the first three of the pleon differing but little from one another in length, the second to the fourth of the peræon with the lower part convex, directed forwards; all laterally dimpled; the side-plates all shallow, the first four pairs with the front corner directed forwards; not contiguous to one another; the postero-lateral corners of the first three pleon-segments somewhat squared.

Eyes not perceived.

Upper Antennæ.—The first joint considerably longer than the head, narrowing a little distally. The rest of the joints missing.

Lower Antennæ.—The first two joints short, the gland-cone acute, a little decurrent; the third joint much longer than the first two united, half the length of the first joint of the upper antennæ, with some marginal spines and spinules. The remaining joints missing. An incomplete antenna, which occurred with the specimen and may possibly belong to it, began with a long narrow joint which might be the fourth; this had several marginal spines, and was followed by a similar but rather thinner joint of about equal length, and a flagellum of nine joints, together equal to the last of the peduncle; these joints were tipped with groups of long slender spines, and the last three had each a conspicuous pair of short, stiff, curved spines.

Upper Lip.—The distal margin broad, unsymmetrically and rather flatly bilobed, the small emargination being almost in the centre; the inner plate with a nearly straight distal edge.

Mandibles.—The cutting plate on the left mandible is divided into four strong unequal teeth; on the right mandible it has two strong teeth and three that are minute; the secondary plate on the left mandible has three strong teeth and a denticle; on the right mandible this plate is of slighter build, with two prominent slender teeth, and three little denticles; the spine-row contains about ten long curved spines, bent, feathered, and denticulate; the molar tubercle is large and prominent, with the dentate crown furred on the sides; there is a blunt-headed process near the base of the palp; the first joint of the palp is much longer than broad; the second joint is very long, with about sixteen spines in two rows along the front, all slender, some very long, lightly feathered, the outer apex also has a long spine; the third joint is more than half the length of the second, with spines at two points of the front margin, all round the apex, and in four rows on the surface near the distal half of the outer margin; these spines are strongly pectinate almost to the very tip, and being very

long and most of them a little curved, form in the aggregate a thick bush reaching beyond the apex.

Lower Lip.—The distal margins of the principal lobes broadly rounded, the inner margins dehiscent, retreating from one another before they re-advance to meet near the base; the inner lobes oval, with their distal and inner margins, like those of the principal lobes, strongly ciliated; the mandibular processes narrow, divergent.

First Maxillæ.—The inner plate with straight inner margin partly strongly ciliated, and at the narrow apex carrying a seta attended by two or three very small setules; the outer margin convex; the outer plate with a bush of cilia near the base, the apical border carrying eleven strong spines, with strong but not numerous lateral denticles, five of the spines a good deal longer than the rest, one long one and one short one furcate, and one or two more of the short ones with a single denticle, one of them certainly with two denticles; the first joint of the palp is little longer than broad, and has two setules on the outer margin; the second is curved, reaches beyond the outer plate, widens a little distally, has a setule on the outer margin not far from the base, and eight strong spine-teeth on the apical border, the outermost the longest; below these on the surface and approaching the inner margin are four slender spines.

Second Maxillæ.—The inner plate not quite so long as the outer, as broad or distally a little broader; a series of about thirty-five plumose setæ beginning near the base passes in a gentle curve along the surface towards, but not to, the outer apex, a long series of spines passes along the inner margin and becomes crowded at the inner apex, but there stops, leaving the remainder of the distal margin unoccupied; of the outer plate the whole apical margin is crowded with long spines.

Maxillipeds.—The inner plates are broad, reaching about as far as the distal end of the palp's first joint, with plumose setæ on the inner margin, and three spine-teeth and feathered spines on the distal margin; the outer plates reach beyond the middle of the second joint of the palp, with nine spine-teeth on the inner margin, and six longer spines on the apical; the slender spines within the inner margin are long; the first joint of the palp has two spines on its inner margin, and is less than half the length of the long second joint, which is slender, and has numerous long spines on and near the inner margin; the third joint is not longer than the first, the distal half carrying many spines; the finger is narrow and little curved, with a short spine-like movable nail (or ungual spine), the two together longer than the third joint; on the inner margin of the finger, near the base of the nail, three or four setæ or setules are inserted.

First Gnathopods.—The side-plates very small. The first joint scarcely at all covered by the side-plate, of very even breadth throughout, carrying some marginal setules; the second joint short, the distal half of the convex hind margin fringed with slender spines, those near the apex being very long and numerous; the third joint with convex margins converging to an acute apex which rests upon the wrist, the hind margin fringed with

long spines, the front margin applied to the wrist, with numerous spines on the inner surface near it; the wrist not much shorter than the first joint, rather longer and narrower than the hand, the long front margin with apical spines but otherwise nearly smooth, having one or two groups of very slender long spines on the outer surface near it, but the inner surface and the long serrate hind margin crowded with long spines, many, perhaps all, of the spines being pectinate; the hand is oval, with numerous groups of long spines at both margins, the convex palm only slightly distinguished from the hind margin, but with a long palmar spine on the inner surface of the hand a little remote from the margin, the palm itself fringed with submarginal spinules on both sides; the finger fitting the palm, having its inner edge apparently cut into a few decurrent teeth, and when closed having the tip of the nail resting on the surface of the hand.

Second Gnathopods closely resembling the first pair, but the first joint longer and thinner, the spinules or setules numerous on the front margin, the wrist a little longer and narrower, the hand also a little narrower. The marsupial plates narrow.

Peræopods.—The branchial vesicles as observed for the first, second, and third pairs of peræopods were narrowly oval. The marsupial plates of the same three pairs were broader than the branchial vesicles, and in the first two pairs much, in the third a little, longer; in all surrounded by long setæ. Only a single peræopod remained, which became immediately detached on the handling of the specimen. It belongs, I believe, to the third pair. The first joint longer than the following three united, the sides nearly parallel, almost unarmed, with a slender apical spine in front; the second joint short, the front margin convex, with an apical very slender spine; the third joint longer than the fourth, widening distally, the front margin convex, the hinder more straight, both carrying a few spinules; the fourth and fifth joints with the finger are probably not in their natural position in the figure *prp.*, but should be reversed; describing them under this point of view one would say,—fourth joint with the front margin convex, carrying long slightly feathered spines at four points, the hind margin straight, with a strong curved spine at the apex; the fifth joint as long as the third but much thinner, a little curved, the front margin convex, with two spinules on the upper part, and spines and a feathered seta on the apex, the hinder margin concave, with spines at three points, and a large one at the apex; the finger slender, curved, about one-third the length of the fifth joint.

Pleopods.—The peduncles much shorter and broader than the rami, distally widened, so that they come close together, while the slender pairs of rami stand wide apart; the coupling spines have a broad base, a narrow bent shaft, a series of from five to seven strong teeth below the apex on one side, and on the other side apparently only three or four, of which the lowest is very large; the cleft spines are five in number on one pair, perhaps on all three, very slender and brittle, stretching out across the wide interval that separates one inner ramus from the other, and borne on a long first joint which is

dilated at the upper part; the outer ramus is much shorter than the inner, but the number of joints seems to be the same, fourteen, in both.

Uropods.—The peduncles of the first pair a little longer than the outer ramus, with about five spines on each margin, and a large one at the lower apex; the outer ramus long and slender, with long spines, singly or in pairs, at five points of the inner margin, and a group of four or five at the apex; the broader inner ramus is probably longer, but it is broken; the fragment has five long spines on the inner margin, and three nearer the outer margin, at the top of which it has three little spines; the second pair are shorter than the first, the peduncles a little longer than the rami, which are subequal, with a few strong marginal spines, and a group on the rounded apex, of which one is curved; the peduncles of the third pair almost broader than long, nearly concealed by the telson, beneath which their inner edges meet, projecting much beyond the rami; the outer ramus longer than the peduncle, with an apical group of long and very slender spines; the inner ramus oval, less than half the length of the outer, with two spines at, and one a little above, the apex.

The Telson rather broader than long, very little narrowed distally, the distal margin being for the most part convex, with the angled apex of each lateral margin not produced quite so far as the centre of the convexity.

Length.—The specimen, in the position figured, measured, from the rostrum to the extremity of the uropods, nearly thirteen-twentieths of an inch.

Locality.—Station 168, off New Zealand, July 8, 1874; lat. 40° 28′ S., long. 177° 43′ E.; depth, 1100 fathoms; bottom, blue mud; bottom temperature, 40°. One specimen, female.

Remark.—The specific name is derived from the Greek *βαθυπλόος*, going deep in the water.

Family Dulichiidæ.

In 1849 Dana established the Dulichidæ as sixth family of the Gammaracea, containing the single genus *Dulichia*, Krøyer; in 1852 he made it the first family of the Gammaridea (see Note on Dana, 1852, p. 260). In 1857 Spence Bate established the Dyopedidæ as "Group B. Aberrantia. Family VIII." of the Gammarina (see Note on Spence Bate, 1857, p. 294); in the same year he altered the name Dyopedidæ into Dulichiadæ, which appears as Dulichidæ in his British Museum Catalogue, and as Dulichiidæ in the British Sessile-eyed Crustacea. In 1859 Bruzelius accepted the Dulichidæ as the first family of the Gammaridea, adding to it the new genus *Lætmatophilus*. The family was also accepted by Goës in 1865, and in the same year Lilljeborg, in one of the tables to page 18 of his paper on the *Lysianassa magellanica*, thus defines

it as the sixth family of the Amphipoda:—"Pedum caudalium unum vel pluria absunt —*Aberrantia*, S. BATE," this character embracing also the families Caprellidæ and Cyamidæ, the next being peculiar to the Dulichidæ, "Cauda minime obsoleta, segmentis 6 composita." The telson is included as one of the *six* segments mentioned. Boeck in 1870 added two new genera, *Paradulichia* and *Xenodice*, and gave the following definition of the family:—

"*Upper Lip* very broad, apically subsinuate.

"*Mandibles* strong, apically dentate, with the secondary plate large and dentate; molar tubercle robust; spines of the spine-row few but strong, serrate at the extremity of the convex margin; the palp long, very slender, its third joint shorter than the second.

"*Lower Lip* strong; with the inner plates very strong.

"*First Maxillæ* with the inner plate larger or smaller; the second joint of the palp elongate, apically spined.

"*Maxillipeds* having the outer plate armed with thick spines on the inner margin; the fourth joint of the palp thick, apically armed with one strong unguiform spine.

"The body elongate, linear, depressed; the side-plates very small; the pleon consisting of only five segments and furnished with five pairs of appendages, (the sixth segment of the peræon generally coalesced with the seventh).

"*Upper* and *Lower Antennæ* subpediform, elongate, (the upper generally furnished with an accessory flagellum)."

The two statements which I have enclosed in brackets were added in 1876. In 1882 Sars places the Dulichiidæ as the twenty-second and last family of the Gammarina, with the four genera included in it by Boeck. The later definitions of the family by Carus and Gerstaecker are quoted in the remarks on the genus *Platophium*. All writers who have defined the family have not unnaturally laid stress on the want of the full number of the segments in the pleon. Spence Bate considers that the sixth segment is wanting. Haswell, in describing "*Cyrtophium* (*?*) *hystrix*," which he afterwards transferred to *Lætmatophilus*, speaks of "the absence of the fourth segment of the pleon." Gerstaecker regards the fourth and fifth segments of the pleon as coalesced. Of the three opinions this seems the most probable, but the further alternative, that the fifth segment is wanting, may have better claims to acceptance than any of them. However that may be, it is not so much the position of the missing segment, as the fact of its absence or indistinguishable coalescence, that causes a very great difficulty as regards classification. In the genus *Platophium*, as will be seen, the number of segments is complete, and yet in other respects this genus bears so close a relationship to *Lætmatophilus*, that it cannot be satisfactory to classify them in different families. In speaking therefore of the Dulichiidæ as having only five segments and five pairs of appendages to the pleon, the convenient expression plerumque, *for the most part*, ought to be added.

Genus *Platophium*, Dana, 1852.

1852. *Platophium*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 831, 837, 1441.
1857. *Cyrtophium*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. (sep. copy, p. 17).
1862. „ (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 273.
1862. „ Bate and Westwood, Brit. Sess. Crust., vol. i. p. 479.
1878. „ Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 59.
1880. „ (*pars*), Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 342.
1880. „ Nebeski, Beiträge zur Kenntniss der Amph. der Adria, p. 46.
1882. „ (*pars*), Haswell, Catal. Australian Crust., p. 271.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 390.
1885. *Dexiocerella*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. i. (extr., pp. 13, 15, 16, 17).
1886. *Cyrtophium*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 494.

For the original definition of the genus, see Note on Dana, 1852 (p. 257). For *Dexiocerella*, see Note on Haswell, 1885 (p. 566). Spence Bate united *Platophium* and *Cyrtophium* under the latter name, and Mr. Haswell re-divided the genus into *Dexiocerella* and *Cyrtophium*, giving the former name to species which will properly fall under Dana's *Platophium*. Carus in defining the "Tribus, Crevettina," gives as a character, "pedum abdominalium paria tria (stili caudales) bene formati, sæpe elongati." He places immediately after this the following definition of "1. Fam. Dulichiidæ Cls. Corpus lineare, thorace valde elongato 6-articulato, articulis 2 ultimis connatis, abdomine 5-articulato, subtus inflexo, sine stilis caudalibus; antennæ I. ramo secundario parvo, II. post superiores insertæ; glandulæ pedum III. et IV. nullæ." Of this family he makes Dana's *Cyrtophium* the first genus, including in it Dana's *Platophium*. But after giving to the tribe three pairs of uropods (stili caudales) well developed, and leaving the family without any, he describes the genus as having the last pair rudimentary, and for the species *Cyrtophium darwinii*, Spence Bate, he makes mention of three pairs ("uropoda penultima præcedentibus multo breviora, ramis inæqualibus, ultima rudimentaria"). Some words have perhaps been omitted from the definition of the family, the presence of which would have cleared up the confusion, but it is important to observe that two other statements in that definition exclude both *Platophium* and *Cyrtophium* of Dana, for in both those genera the peræon has seven distinct segments and the pleon its full number of six.

Gerstaecker thus defines the family "Dulichidæ, Dana;"—"Both pairs of antennæ with strongly elongated peduncle and short flagellum. Head extended, in front obliquely truncate. First segment of the peræon shorter than the following, the sixth and seventh generally completely coalesced. First, third, and fourth [pairs of] limbs short, the three hinder pairs elongate and slender; the two anterior pairs subchelate. The fourth and fifth segments of the pleon coalesced; of the three pairs of uropods one wanting." In defining "*Cyrtophium*, Dana (*Platophium*, Dana)" as the fourth genus of

this family, Gerstaecker expressly says that "the last two segments of the peræon are *not* coalesced." But the impediment remains that in both *Platophium*, Dana, and *Cyrtophium*, Dana, the fourth and fifth segments of the pleon are not coalesced, and no one of the three pairs of uropods is wanting. The requisite alteration of the definition of the family has been already discussed.

Platophium danæ, n. sp. (Pls. CXXVIII., CXXIX.).

Head without a rostrum, the lateral lobes angled; below and behind them each side of the head deeply emarginate for the insertion of the lower antennæ; in the middle of the back of the head there is a large upstanding process; each of the segments of the peræon and of the first two of the pleon is armed with a medio-dorsal carinate tooth or process, which on the first segment of the peræon is small and supplemented by a second; the tooth on the second segment is also small, larger on the third and fourth, and again considerably larger on each of the following five segments; the lateral margins of the third, fourth, fifth, and sixth peræon-segments are tridentate, the edges of all the peræon-segments more or less projecting beyond the side-plates; the seventh of the peræon has a tooth on the hind margin on each side below the dorsal process; in this the first and second pleon-segments resemble it; the postero-lateral angles of these and the third segment are rounded; the third has a transverse dorsal depression; the fourth pleon-segment is narrow and elongate, tending to cylindrical, with a transverse dorsal depression near the base; this segment is perfectly distinct from, and has the dorsal margin raised above, the fifth segment; the fifth and sixth segments are together much shorter than the fourth. The pleon from the fourth segment is strongly flexed. The skin in many parts is furred with short hair.

The Eyes very prominent, hemispherical, projecting just behind and partially on the lateral lobes of the head; the ocelli numerous.

Upper Antennæ.—The first joint rather thick, not so long as the head, with slender spines, chiefly at the lower apex; the second joint thinner, twice as long, with a dozen pairs of long, slender, slightly feathered spines; the third joint rather shorter and thinner than the second, with ten pairs of the like spines; the flagellum of nine or ten joints, together not so long as the first and second of the peduncle united, apically carrying groups of cylinders and some spines much shorter than those of the peduncle; the first joint much longer than the rest, with three or four groups of cylinders; the secondary flagellum of one joint, narrow, slightly tapering, not so long as the first of the primary, armed with a few setules.

Lower Antennæ much longer than the upper. The first two joints very short, the gland-cone very small, acute; the third joint considerably longer than the combined first and second, widening distally, with some slender spines on the lower margin; the fourth

joint three or four times as long as the third, the lower side fringed with two rows of spines, the upper margin having a few short ones; the fifth joint thinner, very much longer than the fourth, fringed with two rows of short spines; the flagellum of four joints, together about equal to the fourth joint of the peduncle, the first much longer than the other three united, the fourth minute, the first three fringed below with many short spines in two rows.

Upper Lip.—The distal margin bilobed, not quite symmetrically; the central part of the distal margin finely furred.

Mandibles.—The cutting edge divided into four teeth and a denticle; the secondary plate having three or four teeth on the left mandible, two slenderer teeth and a denticle on the right mandible; on the left mandible the spine-row has three strong, more or less curved, denticulate spines and a small one; on the right mandible only two strong ones and an attendant small one; the molar tubercle prominent, with a dentate crown, and upon the side, not the edge, of the tubercle, a small laminar process; the process above the tubercle is broad-headed, not reaching the base of the palp; the first joint of the palp narrow in the middle, more than twice as long as broad; the second joint stouter, twice as long as the first, or more, the hind margin a little convex, the front margin tending to concave except at the extremities, along the lower part having a row of five spines, the uppermost the longest, and above these seven long feathered spines at intervals, with other similar spines along the surface; the third joint is rather longer than the first, considerably shorter than the second, like the other two widening distally, but in a greater degree, the distal margin set round with about twenty spines, most of them very long; on the outer surface there is a transverse row of four a little below the apex of the convex outer margin, below these are two, and below the two there are three in single file.

Lower Lip.—The lobes both of the inner and outer plates are rather small, and not conspicuously ciliated; the mandibular processes are not large.

First Maxillæ.—The inner plate appears to be small and smooth; the outer plate not broad, with nine short and rather thin spines on the truncate distal margin, none of the spines apparently having more than a single minute lateral denticle; the first joint of the palp very short, the second long, reaching beyond the outer plate, widening a little distally, with six slightly serrate spine-teeth on the dentate distal margin, this series continued by some slenderer spines, two to four in number, a little way down the inner margin; another series of six or seven slender spines is ranged across the surface, from the distal part of the inner margin towards the apex of the outer.

Second Maxillæ.—The inner plate shorter and narrower than the outer, with a row of plumose setæ beginning at about the middle of the inner margin, and keeping near it, and a row of spines beginning a little higher up and passing round to the outer apex, the convex outer margin being unarmed; the outer plate widens from about the middle and

has long spines round the broad serrate distal margin, which is oblique on the outer side.

Maxillipeds.—The inner plates small, not reaching the distal end of the palp's first joint, with a row of seven plumose setæ beginning high up on the inner margin and passing on to the surface near the apex; the distal margin is broad, with three short spine-teeth and several slender feathered spines; there is another spine-tooth submarginal to the inner apex; the outer plates scarcely reaching beyond the middle of the palp's second joint, with seven spine-teeth spaced along the serrate inner margin, and six spines round the serrate distal margin, of which two might count as long teeth, the others being setiform; the first joint of the palp short; the second considerably more than twice as long, with many groups of long spines along the inner margin, and at the apex on both margins; the third joint about as long as the first, oval, with oblique rows of spines on the surface and many spines about the apex; the finger, if the spine-like nail be included, is even longer than the third joint; its basal part is scarcely so long as the serrate nail, near the root of which, on the inner margin, it has several spines of various sizes, one very similar to the nail, and not much shorter or narrower.

First Gnathopods.—The side-plates of a breadth much less than the length of the segment, the depth less than the breadth, the front margin forming a sharp angle with the lower, the hind margin having a small pointed apex. The first joint almost free from the side-plate, its front margin nearly straight, and unarmed, with an inner margin that has a row of spines round the apical curve; the convex hinder margin has a spinule here and there and near the apex some long setiform spines; the second joint short, with spinules on the front lobe, and a brush of very long setiform spines near the apex behind; the third joint not very long, with convex margins converging to a pointed apex, and many groups of long spines on or near each; the wrist widest where it becomes free from the third joint, subequal in length to the hand, most of the free hind margin fringed with long spines, of which there is a group numbering six or seven across the inner surface, and others near the distal margin; the hand attaining its greatest breadth close to the base, then narrowing to the apex, with five or six long rows of spines encircling the convex front margin; the hind margin, all but a small piece at the base, tending to concave and forming the palm, fringed with long spines, of which also the inner surface carries several groups; the finger long and broad, reaching nearly to the end of the palm, the inner margin divided into many slender teeth. In the female the spines are much fewer and shorter, the wrist and hand are stouter compared with their length, the hind margin or palm of the hand is convex.

Second Gnathopods much larger than the first, and the segment is dilated to suit this great increase. The side-plates larger than the preceding pair, their breadth not equalling the length of the segment, the lower margin presenting a bilobed or trilobed appearance. The first joint almost entirely free from the side-plate, narrow at the neck, widening

distally, much shorter than the hand, the hind margin convex, carrying a few spinules, the front straighter, with long plumose setæ on the lower part projecting from the surface; the second joint short, with some spinules on the front lobe, a few setæ behind; the third joint with convex front and hind margins, the distal margin squarely truncate, all three surrounded by long feathered spines or setæ; the wrist very little longer than the third joint, somewhat triangular, narrower than the hand, with long spines on the hind margin and inner distal margin; the hand of great length, three times as long as the wrist, with a few spines on the long slightly convex front margin; the almost equally long hind margin is thickly fringed with groups of long feathered setiform spines, supplemented by numerous similar groups planted on the surface at a little distance from the margin; the finger is broad, about half the length of the hand, the inner margin seemingly smooth, but bordered with very numerous submarginal setules, and closing over one or two tooth-like processes of the hand's hind margin or palm, at a little distance from that margin's apex; the hand is about three times as long as broad, and is not compressed along the front margin. In the female the spines are comparatively few, the first joint is short, the wrist small, not longer than the third joint, the hand broadly oval instead of elongate, the palm longer than the remaining part of the hind margin, which is separated from it by a sharp apical tooth, within which is a strong palmar spine, against which the broad curved finger impinges, having but few setules at the smooth inner margin.

First Peræopods.—The side-plates smaller than the preceding pair, the segment which carries them being narrower not only than the preceding, but to some extent than the succeeding segment; the lower margin of the plate almost tridentate; the first joint nearly free from the side-plate, narrow, little longer than the fifth joint, with some spinules along the hind margin and lower part of the front, and three small spines at the top of the front margin; the second joint longer than broad, with spinules on the front lobe and small spines on the apex behind; the third joint widening distally, a little shorter than the fourth, with a spinule and four groups of small spines behind, three spinules and three groups in front; the fourth joint a little shorter than the fifth, with six groups of spines behind, three or four in front; the fifth joint with five groups of spines behind and three in front; the finger rather long and slender, three-fourths the length of the fifth joint, with a short sharp nail, and a dozen short setules or hairs along the convex outer margin.

Second Peræopods scarcely differing from the first, but with the first joint shorter.

Third Peræopods.—The side-plates bilobed, the front lobe rounded, nearly as deep as the preceding pair, the hind lobe shallow. The first joint of the limb shorter than the fifth, not much expanded, the frontmargin nearly straight, with a little spine here and, there, and an apical group of short spines, the hind margin forming a lobe at the top, distally dividing into two margins, each of which carries two or three spines; the second joint has some short spines at the front apex; the third joint a little longer than the

fourth, subequal to the fifth, widening distally, with a group of rather long spines on the somewhat decurrent hinder apex, and smaller spines at three points of the hinder and four of the front margin; the armature of the fourth joint similar; the fifth joint with spines at five points on each margin, the front ones the stronger, and, as on the preceding joint, a little curved towards the margin; the finger about three-quarters as long as the fifth joint, at first straight, distally curved, with a short sharp nail, hairs along the hind margin, and a dorsal cilium close to the hinge.

Fourth Peræopods.—Side-plates as in the preceding segment, but rather smaller. The limb like that of the third peræopods, but longer, and with the first joint rather wider.

Fifth Peræopods.—Side-plates not bilobed; the limb like that of the fourth peræopods, but with the first joint rather larger.

Pleopods slender; coupling spines stout, a little bent, with two pairs of retroverted hooks, the pair below the apical being the larger; the cleft spines appear to be a series of five on the first pair, of three on the second and third; the joints of the rami numbering from eleven to thirteen. The figure *plp.sp.* shows two of the coupling spines of one peduncle interlocked with one from the peduncle of the opposite side.

Uropods.—Peduncles of the first pair about as long as the inner ramus, having five spines on one of the upper margins, and a longer spine on the lower apex; the outer ramus normally shorter than the inner, but on one side of the specimen figured nearly equal to it; the proportions seem to be not quite constant; both rami have spines on the margins and an apical group; the inner ramus has a dozen spines on the inner margin, five or six on the outer, a long and short one at the apex, with two of more equal length above, this arrangement of the apical group applying to both rami in this and the following uropods; peduncles of the second pair much shorter than the inner ramus, the outer ramus shorter than the inner, both with marginal and apical spines; the third uropods resembling the bowl of a spoon, with the cavity turned towards the telson, beyond which they project a little, the margin set round with six or seven spines, of which the inner are somewhat setiform.

The Telson scarcely longer than broad, with a narrowly rounded end, at a little distance from which, on either side, is a group of three small cilia; on the upper surface, at about the middle, begins a bluntly conical, minutely furred projection, not reaching quite to the distal margin, carrying two prominent spines on the upper margin of its apex.

Length.—The length along the back of the peræon and first two segments of the pleon, of the specimen which supplied figure D, was two-fifths of an inch.

Locality.—Nine specimens, including males and females, were obtained at Kerguelen, some, probably all, from Station 149H; off Cumberland Bay; Jan. 29, 1874; depth, 127 fathoms; bottom, volcanic mud.

Remarks.—The specific name is given in honour of the founder of the genus *Platophium*. The description refers to the male, except where the contrary is expressly stated. This species bears a strong resemblance to the Australian species which Mr. Haswell at first named *Cyrtophium dentatum*, and afterwards *Dexiocerella dentata*. He has very kindly sent me specimens. There are not the same number of dorsal teeth in the Australian as in the Kerguelen species.

Platophium cheloniæ, n. sp. (Pl. CXXX.).

The lateral lobes of the head small, rounded; the back rounded, dorsally broad at the middle of the peræon; the postero-lateral angles of the first three pleon-segments rounded; the fourth segment longer than any of the other segments, distinct from the fifth, and much longer than the fifth and sixth united; the pleon not quite so strongly flexed as in *Platophium danæ*. The skin having in many parts dark stellate markings or round spots, sometimes crowded together, sometimes few and far between.

The Eyes round, near the lateral lobes.

Upper Antennæ.—The first joint much thicker than those which follow, not much longer than broad, with some slender feathered spines on the lower margin; the second joint scarcely once and a half as long as the first, with three groups of spinules on the upper margin, six or seven of feathered spines on the lower, many of them long; the third joint thinner and a little shorter, similarly equipped; the flagellum stout like the peduncle, of four joints, together scarcely longer than the second of the peduncle, the first not quite so long as the next two united, all carrying feathered spines, spinules, and cylinders.

Lower Antennæ not elongate, longer than the upper. The first two joints broader than long, the gland-cone scarcely produced; the third joint subequal to the first two united, with a lateral distal lobe, and groups of spines upon this and on the lower margin; the fourth joint stout, longer than the preceding three united, widening distally, with feathered spines at six or seven points of the lower margin, and several groups of spines upon the surface and at the distal lobes; the fifth joint rather longer, similarly armed, but with the marginal spines shorter and fewer; the flagellum of three joints, the first longer than the second and third united, the three together not so long as the fourth joint of the peduncle, all tipped with strong curved spines as well as slender spines and spinules.

Upper Lip.—The outer plate with its distal margin rather deeply incised so as to form two somewhat narrow finely furred lobes, one slightly in advance of the other.

Mandibles.—The cutting edge divided into six teeth; the secondary plate with four small sharp teeth on the left mandible, and with a denticulate edge rather than teeth on the right, this plate being as usual slighter on the right than on the left mandible,

but in this species not stout on either; the spine-row consists on the left mandible of three, on the right of two, short, moderately broad spines tapering distally and much denticulated; the molar tubercle moderately prominent, with a very small laminar process on the edge; the first joint of the palp a little longer than broad, widening distally; the second joint wider than the first at the base and widening distally, about twice as long as broad, with about eighteen feathered spines on the surface near the front margin; the third joint wider and a little longer than the first, but narrower than the second, not twice as long as broad, with about sixteen long feathered or pectinate spines round the distal margin, a row of four on the surface below the apex near the outer margin, and another row of two or three below these.

Lower Lip.—The principal lobes distally rounded, scarcely broader than the distal part of the inner lobes; the mandibular processes produced to a narrow but not acute point, with the inner margins tending to concave, the outer a little convex.

First Maxillæ.—The inner plate if rightly observed is small, with a small seta or two at the apex; the outer plate not elongate, narrowing from the middle to the truncate distal margin, which carries nine spines, some with one lateral denticle, some with two, none, I think, with more; the first joint of the palp very short, the second reaching beyond the outer plate, narrower at the two ends than in the middle, the distal margin dentate, carrying four spine-teeth with little denticles on the middle of their outer edge; there are five slender spines close to the upper part of the inner margin, two submarginal to the apical border.

Second Maxillæ.—The inner plate a little shorter and a good deal narrower than the outer, the inner margin smooth till near the apex, then serrate and furnished with plumose setæ; the apex narrow, fringed with spines, some of which also are arranged alongside of the setæ; the broader apex of the outer plate in like manner carrying numerous long spines, crowded on the inner part, spaced on the outer slope.

Maxillipeds rather short. The inner plates narrow, reaching beyond the first joint of the palp, the inner distal angle occupied by feathered setæ, with a bent spine-tooth just below the apex, the distal margin a little sinuous, with three (or two) spine-teeth and several slender feathered spines; the outer plates reaching beyond the middle of the second joint of the palp, with twelve spine-teeth along the inner margin, a thirteenth on the distal margin, followed by three setiform spines; the first joint of the palp very short, with some spines on the inner apex; the second joint about twice as long as the first, with the slender spines on the inner margin not very numerous; the third joint as long as the first, widening distally, with long feathered spines about the distal half; the finger not as long as the third joint, unless the pectinate ungual spine be included: this spine is attended by others inserted near it on the inner apical margin of the finger, one of the three spines being similar to the nail, and nearly as long.

First Gnathopods.—Side-plates wider below than above, the front margin nearly

straight, directed obliquely forwards, joining the straight lower margin by a narrowly rounded corner, the depth less than the greatest breadth. The first joint nearly free from the side-plate, narrow at the neck, almost unarmed; the second joint short, with a spinule at the front lobe, and some slender spines on the apex behind; the third joint a little longer than the second, wider above than below, with a group of spines near the middle of the front margin, and several spines round and near the curve which joins the convex hinder with the sinuous distal margin; the wrist about as long and as broad as the hand, narrowest at the two ends, the front margin convex, with three small groups of spines near it, the hind margin fringed with many feathered spines, of which the surface has various groups; the hand broad-oval, with six or seven groups of rather long spines along the convex front margin, which is almost continuous with that of the wrist; the hind margin, most of which may be regarded as a palm, is fringed with many feathered spines, and there are various groups of spines on the inner surface; the finger is short, curved, and broad, a good deal stouter than the hand, with a small dorsal cilium near the base, the inner margin having a sharp decurrent tooth beyond the middle, and a longer one at the base of the sharp nail.

Second Gnathopods.—The side-plates small, broader than deep, with a spinule at the front corner of the lower margin. Branchial vesicles oval, much larger than the side-plates, as long as the first joint, and much broader. The first joint nearly free from the side-plate, rather larger than in the first gnathopods, about as long as the hand, with four spines on the convex hind margin; the second joint with two or three spines at the apex behind; the third joint with convex front and hind margins, the latter carrying at the rounded apex a group of three or four spines, above which are two other groups; the wrist shorter than the third joint which completely overlaps it behind, a little wider than long, distally cup-like, but with the distal margin convex, with a few spines round the apical part before and behind; the hand large, broad oval, much wider than the wrist from the very base, with spines singly or in groups at six or seven points round the front margin, at several points along the inner surface, at a little distance from and others near the hind margin, which has three or four groups on the proximal part, and is then distinguished from the palm by a minute tooth or notch, near to which are planted two palmar spines; the palm itself, which forms more than half the convex hind margin, has no spines actually on the rim, though many submarginal; the finger is broad, as long as the palm, with a small decurrent tooth on the inner margin at the base of the nail; and five minute spine-teeth at intervals of the otherwise smooth inner margin, with a few submarginal setules.

First Peræopods.—Side-plates and the branchial vesicles as in the preceding segment. The first joint almost free from the side-plate, narrow at the neck, then expanding on both sides, the hind margin having spines at two or three points of the upper half, and at the apex, the front margin convex, forming a winged expansion, fringed with six or seven

spines, the inner surface with a distinct front margin almost parallel with the hinder, and therefore to some extent concave; the second joint with one or two little spines on the front lobe; the third joint widened distally, as long as the fourth and rather wider, with very slight spines at two points of the straight hind margin, and stronger spines at three or four points of the convex front; the fourth joint shorter than the fifth, with three groups of spines on the convex front, three on the straight hinder margin, and some spinules on the hinder slope of the distal margin; the fifth joint with four groups of spines on each margin; the finger more than half the length of the fifth joint, broad at the base, much curved, distally acute.

Second Peræopods similar to the first, but with the first joint rather shorter and broader, and having spines at five points on the hind margin of the fifth joint.

Third Peræopods.—The side-plates less deep than the preceding pair. The branchial vesicles similar to the preceding pair, and like them directed forwards. The limb resembling in form the two preceding pairs of peræopods, but with the third, fourth, and fifth joints longer. The first not longer than in the preceding pair, with a few small spines within the margin at the upper part in front, four spines on the hind margin of the wing, one near the apex of the inner hind margin; the second joint with two or three small spines on the hind lobe; the third joint widening distally, not quite so long as the fourth, with small spines at three points of the front margin, and five points of the convex hind margin; the fourth joint shorter than the fifth, with spines at three points in front and four behind; the fifth joint with four groups in front and five behind; the finger not half the length of the fifth joint, broad at the base, distally strongly curved and acute, with two slender setules near the base of the nail, and another a little further off.

Fourth Peræopods.—The side-plates smaller than the preceding pair, very shallow. The limb like the preceding pair, but with all the joints longer, and the spines stronger; the first joint with its hind margin less convex and with only two spines.

Fifth Peræopods similar to the fourth but longer; the first joint narrowed below.

Pleopods.—Instead of the usual pair of coupling spines on each peduncle, there is here a row of nine, each with an apical pair of hooks, and a second rather larger pair just below it; whether any of the spines on the inner margin of the first joint of the inner ramus are cleft, I have not been able to determine; the interlocking apparatus of the coupling spines is so strong that the assistance of cleft spines may be unnecessary; the joints of the rami number from thirteen to fifteen. In *Cyrtophium minutum*, Haswell, I find a row of six coupling spines.

Uropods.—The first pair reach beyond the second; the peduncles equal in length to the inner ramus, which is considerably longer than the outer; the peduncles and rami have many lateral spines, and the blunt apices of the rami have each a group in which one of the spines is long; the peduncles of the second pair shorter than the inner, a little longer than the outer, ramus; the rami armed as in the first pair; the third

uropods having only an oval plate not so long as the telson, but reaching a little beyond it, with some spinules on the border.

The Telson rather broader than long, very much rounded, with a broad laminar projection on the upper surface beyond the centre, not reaching the distal margin, carrying two spines.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the back of the third pleon-segment, a little over one-fifth of an inch.

Locality.—The single specimen, perhaps not adult, was labelled as obtained from *Chelonia imbricata*, Atlantic.

Remarks.—The specific name is taken from the animal on which the specimen was found lodging.

This species differs from *Platophium danæ* in having the palps of the mandibles and the maxillipeds less elongate, as well as in other points of more obviously specific value, but the general character of the mouth-organs and antennæ, together with the agreement in the structure of the pleon, seemed to warrant its being placed in the same genus.

Platophium inconspicuum, n. sp. (Pl. CXXXI.).

Rostrum inconspicuous; the outer corners of the front of the head rounded; back of the animal broad at the centre of the peræon; pleon closely flexed; first three segments of the pleon with the postero-lateral angles rounded; the fourth segment of the pleon longer than any other segment, very much longer than the fifth and sixth segments united; dark pigment-flakes retaining their colour in the spirit-preserved specimen.

Eyes broad oval, comparatively large, with numerous short ocelli.

Upper Antennæ.—First joint rather thick, shorter than the head, carrying a few slight spines. The remaining joints broken off.

Lower Antennæ.—First joint a little expanded, the first and second joints short, the gland-cone small; the third joint thick, little longer than broad, with a few slender spines; the other joints missing.

Upper Lip unsymmetrically bilobed.

Mandibles.—The cutting edge narrow, sharply toothed with five or six teeth; the secondary plate with four or five teeth which are thin and sharp; the spine-row with two rather broad denticulate spines; the molar tubercle broad, with strongly dentate crown, and a small laminar distally denticulate process on the edge of it; the first joint of the palp much longer than broad, narrow at the base, widening distally; the second joint about twice as long as the first, with three or four spines on and near the front

margin, and an oblique row of four long ones on the surface near the apex; the third joint intermediate in length between the first and second, widening distally, with seven pairs of long pectinate spines round the apical border, three spines a little below the apex near the outer margin, and another set below these.

Lower Lip.—The principal lobes rather narrowly, the inner lobes rather broadly, rounded distally.

First Maxillæ.—Inner plate not observed; outer plate with nine spines, none of them stout or with strong lateral denticles; two of the outermost appear to have three small lateral denticles, and three of the shorter spines show each a single denticle on the outer side; the first joint of the palp short, the second reaching beyond the outer plate, widening distally, on the dentate apical margin having four slender denticulate spine-teeth, and a more slender spine (perhaps belonging to this series) at the top of the inner margin; there are three or four other slender spines on the surface.

Second Maxillæ resembling those of *Platophium chelonia*.

Maxillipeds.—Inner plates broad, about reaching the distal end of the palp's first joint, in armature nearly as in *Platophium chelonia;* the outer plates reaching beyond the middle of the palp's second joint, with four distant spine-teeth on the crenate distal part of the inner margin, and four or five other spines, forming the usual gradation, round the serrate distal margin; the palp nearly as in the species just mentioned, but the basal part of the finger very short, only a little longer than broad, and carrying at the apex a pectinate spine much more than twice as long as itself, besides a group of shorter spines, which are also longer than itself.

First Gnathopods.—The side-plates broader below than above, produced below towards the front of the head in a narrow rounded point which carries a setule in a notch. The first joint nearly free from the side-plates, very little longer than the wrist, widening distally, the margins almost unarmed, except apically; the second joint short, with a group of long slender spines near the apex behind; the third joint scarcely longer than the second, the front and hind margins convex, the inner surface carrying some groups of long spines and the hinder margin likewise; the wrist a little longer and narrower than the hand, narrowing distally, the front margin with spines at the apex and one or two above it, the hind margin fringed with many long spines planted on or near it, the surface also carrying some more remote from the margin; the hand widening distally, the front margin convex, with some strong spines at various points on and near it, the surface also carrying spines at different points, the hind margin very slightly convex, smooth till near the palm, then having a long spine followed by a short one, and at the apex a palmar spine, which is succeeded by two or three others; the palm forming an obtuse angle with the hind margin is convex, pectinate, bordered with many submarginal spines, long and short, and has close to the hinge of the finger an appearance of a laminar process or broad tooth (not figured); the finger is short and broad, not reaching beyond the palm,

with a row of eight setules of different lengths set close together near the base of the sharp curved nail.

Second Gnathopods.—The side-plates broader than deep. The branchial vesicles more or less oval, not very large. The marsupial plates of great size, much longer and very much broader than the first joint of the limb, narrowing distally, surrounded by setæ not so long as the breadth of the plate. The first joint larger than in the first gnathopods, but not so long as the hand, widening distally, with a few small spines on each margin; the second joint as in the first pair; the third joint a little longer than the second, with spines at two or three points of the hind margin and a group at its apex including two short spines, the distal margin straight; the wrist very small, scarcely as long as the third joint, which overlaps it, broader than long, with a long spine on the narrow hinder apex; the hand large, abruptly wider than the wrist, distally narrowing, with spines at four points of the convex front margin, the hind margin very short, carrying two slender spines and forming an apical tooth beyond this. The very oblique, slightly convex, deeply toothed or serrate palmar margin completes the distance required to match the long front margin; the serrations are occupied by a series of seven or eight strong palmar spines, other slender spines projecting from the surface; the finger is broad, of a length to match the long palm, the outer margin greatly curved, and having five or six submarginal setules; the inner margin is nearly straight till the narrow, acute, and inward curving nail is reached; at the base of this there are three or four setules close together, others being dispersed along the margin, and some extremely small triangular spine-teeth at intervals.

The Peræopods were unfortunately all missing. The second pair of marsupial plates were similar to the first, but more regularly oval. None of the branchial vesicles were very large.

Pleopods.—The coupling spines two in number, each having two pairs of retroverted hooks; there were no *discernibly* cleft spines; the joints were seven in number in each ramus, the terminal joint being unusually stout.

Uropods.—The first pair reaching back much beyond the second, the peduncles as long as the outer, shorter than the inner ramus, with four spines on the outer margin, and a large spine on the lower apex; the outer ramus with three or four marginal spines, and an apical group of four, of which one is very long; the inner ramus with seven spines along its slightly pectinate inner margin, three or four on the outer, and the apical group; the peduncles of the second pair very short, as long as the outer ramus, which has one submarginal spine and the apical group of four, including as in the other cases one very long one; the inner ramus is a little longer, with two spines on the outer margin, three on the inner, and the apical group; each of the third uropods is represented by a small inward-bent oval plate, shorter than the telson and not nearly reaching the end of it; these plates are covered by the telson except for a small strip of the outer margin;

they have a spinule on the inner side of the distal end. In the figure *ur.*2., the line is incomplete which should have separated the inner ramus from the peduncle.

The Telson seems to be rather longer than broad, much rounded distally, with two spines on the surface at about the centre; whether these are planted on a raised process as in the companion species, I could not definitely ascertain.

Length.—The specimen measured, in a straight line from the front of the head to the back of the second pleon-segment, one-fifth of an inch.

Locality.—The single incomplete specimen, a female, was labelled as obtained at Port Jackson, 2 to 10 fathoms.

Remarks.—The specific name refers to the small size of the creature, and its want of conspicuous armature.

It is separated by the structure of the gnathopods from the species which Mr. Haswell has named *Dexiocerella lobata* and *Dexiocerella lævis*. These are only partially figured in Mr. Haswell's paper, and I have not seen specimens.

Genus *Lætmatophilus*, Bruzelius, 1859.

1859. *Lætmatophilus*, Bruzelius, Skand. Amph. Gamm., p. 10.
1862. *Cyrtophium* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 273.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 285.
1870. *Lætmatophilus*, Boeck, Crust. amph. bor. et arct., p. 185 (265).
1876. „ Boeck, De Skand. og Arkt. Amph., p. 662.
1877. „ Metzger, Crust. Isop. Amphip. et Decap. Daniæ, p. 166.
1882. „ Sars, Oversigt af Norges Crustaceer, p. 32.
1885. *Læmatophilus*, Haswell, Proc. Linn. Soc. N.S.W., vol. x. pt. 1 (extr. p. 16).
1886. *Lætmatophilus*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 493.
1886. „ (*pars*), Norman, Museum Normanianum, pt. iii. Crustacea, p. 17.

For the original definition of the genus, see Note on Bruzelius, 1859 (p. 312). Boeck gives the following definition:—

"Sixth and seventh segments of the peræon coalesced.[1]

"*Upper Antennæ* attached to the great frontal process; flagellum not many-jointed; accessory flagellum wanting.

"*Lower Antennæ* equal to the *Upper* in thickness and length.

"*First* and *Second Gnathopods* with subcheliform hands; the *Second* pair the larger.

"*First* and *Second Peræopods* alike in shape, very strong; the third joint very short, the fourth and fifth elongate.

"The last three pairs of *Peræopods* alike in shape; the *Fourth* longer than the *Third*, the *Fifth* than the *Fourth*.

"The *First Uropods* biramous; the outer ramus shorter than the inner.

"The *Last Uropods* tubercular in form."

[1] This is not the case in the species now to be described.

Lætmatophilus purus, n. sp. (Pl. CXXXII.).

The front of the head somewhat produced, with a small pointed process in advance of the eyes on each side; the lower part emarginate for the insertion of the lower antennæ to the rear of the upper; the head with a small dorsal depression to the rear; the first five segments of the peræon each with a dorsal depression, giving the back a corrugated appearance; the third segment has a small ventral process at about the middle, and the second segment is a little produced ventrally, but not into a definite process; the fourth segment of the pleon is a little longer than any of the preceding segments, narrow, cylindrical; the following segment is very short, None of the side-plates are deep; the branchial vesicles on the second to the sixth peræon-segments are strongly bent forward, the pair attached to the second gnathopods being much smaller than the following pairs.

Eyes round, prominent on special lobes; retaining a dark colour in the specimen mounted in Canada balsam; the outer ring of ocelli contained thirty.

Upper Antennæ.—The first joint shorter than the head; the second thinner but much longer, the under margin fringed with long setiform spines; the third joint a little shorter and thinner, similarly furnished; the flagellum of three joints, together not quite so long as the third joint of the peduncle, similarly armed, the first joint much longer than the other two united, the second twice as long as the third.

Lower Antennæ stouter and much longer than the upper; the first two joints short, the gland-cone small; the third joint not long, rather thick; the fourth joint thinner than the preceding, as long as the second joint of the upper antennæ, with slender spines on the lower margin, some shorter and stronger spines on the upper, and some lateral groups; the fifth joint considerably longer than the fourth, with many spines on the lower margin; the flagellum practically of one thick joint, narrowing only near the apex, a little more than half the length of the fifth joint of the peduncle, with short spines of various thicknesses distributed about it, including two curved ones on the apex; the apex under a high power appearing to consist of two minute joints scarcely distinct from the large one.

Upper Lip.—The distal margin is here, if I am not mistaken, rather deeply but not broadly emarginate; but in *Lætmatophilus tuberculatus* Boeck says that the upper lip is distally rounded (paa Enden afrundet).

Mandibles not well observed; molar tubercle prominent, palp nearly as in *Platophium danæ.*

Lower Lip.—Principal lobes broad, the convex distal and sinuous inner margins meeting in a small projecting lobe; the mandibular processes rather long, divergent, apically narrowed.

First Maxillæ.—Inner plate inconspicuous; outer plate apparently with nine spines

on the distal margin, the lateral denticles of the spines few and not prominent; the first joint of the palp short, the second joint long, with six rather long spine-teeth, the outermost longest, on the distal margin, and two or three slender spines at the inner corner; some longer setiform spines on the surface.

Second Maxillæ.—The inner plate shorter than the outer.

Maxillipeds.—The inner plates reaching about to the apex of the first joint of the palp, with feathered setæ on the inner margin, and on the broad distal margin some feathered spines and two short spine-teeth which are set wide apart; the outer plates broad, reaching beyond the middle of the second joint of the palp, having on the inner margin several spine-teeth not set very closely together, and followed on the apical margin by some longer curved spines; the first joint of the palp short, the second twice as long, not very strongly armed, the third a little longer than the first, extended over the base of the very short and small conical finger, the truncate tip of which carries some spines which are longer than the body of the finger.

First Gnathopods.—The first joint almost free from the side-plates, as is usual with all the limbs of the peræon in this genus; equal in length to the wrist or the hand, but narrower than either, narrowest at the neck, the margins almost entirely unarmed. The second joint longer than broad, with a few setiform spines on the lower part of the hind margin, and a group of three spines on the surface near the upper part of the front margin; the third joint broader than the second but not longer, tending to diamond-shaped, the convex hinder margin fringed with long pectinate spines, the surface having two groups; the wrist subequal in length to the hand, with two or three groups of long spines on the surface near the long front margin, and a few other groups elsewhere on the surface; the convex, gently crenate hind margin fringed with long feathered spines, twenty or more; the width of the wrist is greatest where it becomes free from the third joint, and lessens very gradually till quite at the distal end; the hand, starting from a narrow neck, widens immediately to its greatest breadth, and thence narrows gradually till at the distal end it is as narrow as at the base; there are several groups of long spines on and adjacent to the convex front margin, and on various parts of the surface, especially near the apex; at the greatest breadth, and therefore not far from the base, the long, crenate, slightly convex palm margin begins, and is bordered with a great number of long feathered spines, but also it is ornamented and armed by a row of ten palmar spines with serrate edges, set close together, not on the margin, but so far within the surface that the tips of most of them project beyond it; the long and strong finger matches this margin and has the distal half of its inner margin set with about a dozen slightly decurrent spine-teeth, its tip being formed by a small curved nail; the outer margin is convex.

Second Gnathopods much larger than the first. The first joint narrow at the neck, then widening so as to be much broader though it is not longer than the first joint in

the preceding pair; the hind margin convex at the upper part, then straight, carrying a setule here and there; the front margin double, nearly straight till the apex, which is produced on each border forwards rather than downwards in a pointed process; the second joint short, not longer than broad; the third joint rather longer than the second, the front and hind margins convex, the lower narrow, concave, the hinder with some small groups of spines, and a sharply pointed apex; the wrist diminutive, not so long as the third joint and not broader than long; the hand much longer than the four preceding joints united, and more than twice as broad as the first joint; it widens at once on both sides of the wrist, and has a convex front margin, on and near to which there are several groups of tolerably stout spines; the front margin is almost straight, till near the apex, when it forms a narrow, blunt process or tooth and immediately beyond this a broad process, sharp at one end, but flattened towards the hinge of the finger; the surface near the hind margin is set with many groups of slender spines, and the hind margin with its processes is fringed in like manner; the very long and strong finger presses in closing against the acute points of the processes, and then, leaving a small interval between its smooth inner margin and the margin of the hand, rests its apical part against the side of the hand, not far from the base; there is no appearance of a nail; the greatest width of the hand is nearly at the level which the tip of the finger reaches, and is not equal to half the length.

The First and *Second Peræopods* were missing.

The Third, Fourth, and *Fifth Peræopods* were scarcely distinguishable from one another. The first joint a little longer than the third, but much shorter than the fourth or fifth, the front margin a little convex, carrying here and there a spinule, the hind margin having a little lobe near the top, the lower part nearly straight, carrying one or two strong spines, and apically acute; the second joint as long as broad; the third widening distally, the front straight, with one or two setules, the hind margin having a few strong spines near the middle, and a large group on the blunt decurrent apex; the fourth joint long, widening distally, the front margin straight, with a few setules, the hind margin serrate, with groups of spines at three or four points; the fifth joint still longer, of almost even width throughout, the front margin almost unarmed, the hinder with spines at four points, these spines being less stout than those of the preceding joints; the finger strong, not half the length of the fifth joint, distally very much curved, with a short sharp nail, the dorsal cilium short, close to the hinge.

Pleopods.—The peduncles shorter than the rami; the coupling spines in the first pair were seven in a row, and six or seven in the other pairs, short, with a single pair of retroverted hooks at the apex; the joints of the rami number from eleven to thirteen, the first joint in each ramus being long and slender, except that the upper part on the inner ramus was dilated on the outer side. I could not detect any cleft spines.

Uropods.—The peduncles of the first pair as long as the outer ramus, a little dilated

distally, with five spines on the outer margin and one or two on the inner; the outer ramus with five spines on the outer margin, one or two on the inner, and an apical group, including one spine much larger than the others; the inner ramus broader and very much longer than the outer, with seven spines on each margin, not in pairs, and an apical group of five including one long one; the terminal uropods consist of a pair of narrow oval plates, which reach beyond the telson when extended, but not nearly to the end of the peduncles of the first pair; when directed, in what seems to be their natural position, so that their apices touch, they are almost completely covered by the telson; on the inner side there seems to be a slight constriction before the apex is reached, and a little way above this a small spinule finds its place.

The Telson seems to be almost circular, with a very thin distal edge.

Length.—The specimen, in the position figured, measured, from the front of the head to the extremity of the uropods, just upon a quarter of an inch.

Locality.—The single specimen, no doubt a male, was mounted in Canada balsam during the voyage, and labelled "Caprella purus, on Brissops lyrif. 18 Dec. 73." The date corresponds with Station 142, lat. 35° 4′ S., long. 18° 37′ E.

Remarks.—The specific name adopted is that which was found on the label, and which perhaps referred to the transparency of the specimen.

The species evidently bears a strong resemblance to *Lætmatophilus tuberculatus*, Bruzelius, but in that species the upper and lower antennæ are described and figured as nearly equal, and the hand of the first gnathopods is said to be shorter but broader than the wrist, statements which do not suit the present species, in which moreover the peræopods and branchiæ differ from those figured for the other species.

Family Icilidæ, Dana, 1849.

In 1849 Dana established the Icilidæ as fourth family of the subtribe Gammaracea, placing in it the genera *Icilius*, Dana, and *Pterygocera*, Latreille; in 1852, in the preliminary account of his own collections, he upholds the family with the genus *Icilius* containing the single species *Icilius ovalis*. For his definition of the family, see Note on Dana, 1852 (p. 255). In the same year Dana relinquished the family and made the Icilinæ the third subfamily of the family Corophidæ, with the genera *Icilius* and *Pterygocera*, *Icilius ovalis* being now named *Icilius ellipticus*. For his definition of the group as a subfamily, see Note on Dana, 1852 (p. 257). After a long interval of neglect the title was revived in 1886 by Gerstaecker, who in his "Divisio II., Gammarina," "Tribus I. Corophiina," places "Fam. 4. Icilinæ, Dana," containing the genera "*Icilius* Dana," "*Icridium* Grube (*Pereionotus* Sp. Bate)," "*Phlias* Guér."

For this group Gerstaecker gives the following definition :—"Body broad, depressed, head transverse, widened forwards, the eyes projecting laterally beyond the outline of the head, the upper antennæ without accessory flagellum. The two front pairs of limbs [first and second gnathopods] not differing in character (nicht formell abweichend) from those which follow [the peræopods], with the penultimate joint narrow and the terminal small, unguiform." Upon this it must be remarked that both in *Icilius australis*, Haswell, and in the new species, *Icilius danæ*, there is a small accessory flagellum to the upper antennæ; in *Pereionotus*, Bate and Westwood say that "the hands of the first two pairs [of legs] are subchelate," and so they are in the new genus *Chosroës*, while in at least one species of *Icilius* the third joint in the gnathopods is as usual distinguished from the third joint in the peræopods by its different position in relation to the fourth joint. The strongly developed third uropods in *Chosroës* distinguish it strikingly from the other genera. In *Icilius* and *Chosroës* the upper antennæ are much shorter than the lower, while in *Icridium*, *Pereionotus*, and *Phlias* the upper are the longer. In *Icilius* and *Chosroës* the mandibles have a well-developed three-jointed palp, while in *Icridium*, Grube states that the mandibular palp must be either closely concealed or absent. For *Icridium* also, Grube, whether rightly or wrongly, denies the existence of a telson. On the mouth-organs of *Phlias* and *Pereionotus* nothing, I think, has yet been published. Under these circumstances I provisionally accept the family Icilidæ for the two genera which have come under my own notice, both of which have the body broad and depressed; the eyes lateral, prominent; the mandibles with dentate cutting edge and secondary plate, strong molar tubercle, and three-jointed palp; the upper antennæ much shorter than the lower; the telson not cleft.

Genus *Icilius*, Dana, 1849.

1849. *Icilius*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. viii. No. 22.
1852. „ Dana, Proc. Amer. Acad. of Arts and Sci., vol. ii.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 833, 844, 1441.
1862. „ Spence Bate, Brit. Mus. Catal. Crust. Amph., p. 284.
1880. „ Haswell, Proc. Linn. Soc. N.S.W., vol. iv. pp. 274, 343.
1882. „ Haswell, Catal. Australian Crust., p. 275.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 497.

For the original definitions of the genus, see Notes on Dana, 1849 (p. 229) and 1852 (p. 257). At page 844 of his great work Dana gives a third definition of the genus as follows :—

"Body much compressed. Antennæ elongate, and having long flagella; the inferior pair longest. Feet not prehensile, all vergiform and unguiculate. Caudal styles six, furcate." In the specific description he explains that "the branches of the last pair [of

stylets or uropods] are quite unequal," a character which, in view of *Chosroës*, might be included in the definition of the genus. In the expression "body much compressed" he is evidently not referring to lateral compression, but to that between the dorsal and ventral aspects of the animal, for which the more usual phrase would now be—body much depressed.

Icilius danæ, n. sp. (Pl. CXXXIII.).

Head and peræon not compressed laterally, rostrum small, the peræon widest at the fourth and fifth segments; the seventh segment dorsally produced backwards in a central tooth or angular process; the first and second segments of the pleon produced in like manner, the fourth segment of the pleon much longer than the fifth and sixth united, but from the doubling over it of the third segment its length is not perceived until it is separated from the third segment; the first three segments have the lower margins convex, the hinder sinuous, the postero-lateral angles acute; the sixth segment broader distally than at the base, a little upturned. The skin in many parts covered with rows of little dentate scales (see fig. *gn.*1).

The Eyes set on the sides of the head are prominent, almost spherical, the ocelli of which they are composed being long, narrow, and very numerous.

Upper Antennæ.—The first joint not so long as the head, a little longer and thicker than the second joint, the third thinner and much shorter than the second; all three carrying several groups of slender spines; of the flagellum there are fourteen unequal joints remaining, the first the longest, some, perhaps all, having long apical spines, and being a little dilated distally at the insertion of the slightly feathered spines; the secondary flagellum has a single slender joint, not so long as the first of the primary, but it appears to have one or more joints missing.

Lower Antennæ.—The first and second joints short, the gland-cone narrow and small, not extending along the third joint; the third joint scarcely so long as the united first and second, carrying spines in pairs at two or three points; the fourth joint about three times as long as the third, with several groups of spines; the fifth joint more than once and a half as long as the fourth, with numerous groups of spines along the lower margin and along the side; of the flagellum there are thirty-eight joints remaining, those at the distal end very long and narrow, the whole number together much longer than the long peduncle.

Upper Lip.—There is a shallow emargination in or near the centre of the distal margin, the middle of which is smooth, but has on either side a fur of close-set short cilia directed towards it, the more remote cilia being longer and not closely set.

Mandibles.—The cutting edge with six teeth; the secondary plate with four, this plate forming a thin lamina with very sharp teeth on the right mandible, while on the

left it resembles the principal plate in general structure; the spine-row of nine denticulate spines; the molar tubercle prominent, with a strong circlet of teeth round the crown, the outside of which is strongly ciliated; a round-headed process rises not far from the base of the palp; the first joint of the long palp longer than broad, with convex outer margin, the second joint long, strongly fringed with numerous pectinate spines on both margins, the groups being planted chiefly on the outer surface; the third joint long, curved, shorter than the second joint, fringed for almost the whole length of both margins and at the narrow apex with groups of spines, the concave inner margin having a close row of short spines, besides the less closely set long ones.

Lower Lip.—The principal lobes distally broadly rounded and loosely ciliated; at the junction with the inner margin there are two minute spines, making a kind of apex; lower down on the inner margin are two more; the inner margin is not strongly ciliated, except at the basal part, where the crowded cilia become almost spine-like; the inner lobes are distally broadly rounded and closely furred; the mandibular processes moderately prominent, a little divergent, the apex rounded.

First Maxillæ.—The inner plate narrowing to the rounded apex on which there are four plumose setæ, one smaller than the other three; the broad outer plate has on the slightly convex distal margin eleven spines, of which seven are rather long and slender, with two or three lateral denticles on the inner side, the innermost spine having two or three little denticles also on the outer side; the other four spines are shorter, with a furcate appearance, the apex bending inwards and having on the outer side two unequal lateral teeth; the first joint of the palp is short, the second is long and broad, reaching beyond the outer plates, broader distally than at the base, with a series of twenty or more spines passing round the broad distal margin and some little way down the inner, those on the inner margin being slender, the others being spine-teeth; submarginal to these are about fifteen slender spines; eight or nine slender spines fringe the convex outer margin, the surface carrying six or seven more.

Second Maxillæ.—The plates broad; the inner shorter than the outer, nearly as broad, with plumose setæ along most of the straight inner margin, and some on the surface near the apex, which is broadly rounded, fringed with short spines which stop short of the outer slope; the outer plate is wider distally than at the base, the spines beginning below the middle of the inner margin, one series passing round within the broad rounded distal margin, another passing round the margin, some of the spines being very long, though a few at the outer extremity are comparatively short.

Maxillipeds.—The inner plates broad, not reaching beyond the first joint of the palp, the inner surface having a triangular space covered with spines, the distal margin broad and flat, carrying three spine-teeth and many slender spines; the outer plates not nearly reaching the end of the second joint of the palp, the inner margin carrying about a dozen slender spine-teeth, and the apical margin half-a-dozen; there are besides

many longer spines planted submarginally in groups or singly; the apical margin forms an obtuse angle with the inner; the convex outer margin is quite smooth; the first joint of the palp is broad, with two or three groups of spines near the rounded outer apex; the second joint is not quite twice as long as the first, very broad, with three groups of spines adjacent to the outer margin, the convex inner margin crowded with long spines till near the apex, and at this part the rows of spines are set on the inner surface a little way from the margin, beyond which they greatly project; the third joint rather longer than the first, widening from the base, with the distal half on the front margin and over the inner surface, especially at the apex, set thickly with long spines; the finger slender, tapering, little curved, subequal in length to the third joint, a small spine-like nail forming the acute tip; the dorsal cilium at a little distance from the base.

The *triturating organs* of the stomach show on one side a row of short stout acute spines, within which is a longer row of about twenty-five longer spines, stout, apically denticulate, in a semicircle, the opposite side of the semicircle (or oval) occupied as usual by numerous slender spines, and some of this character rise from the intermediate surface.

First Gnathopods.—The side-plates small. The first joint almost entirely free from the side-plate, shorter than the wrist or hand, with a long spine near the centre of the hind margin; the second joint short, with a large group of long spines at the apex of the hind margin; the third joint rather longer, with several groups of spines along the serrate hind margin and the oblique distal margin, which has an acute apex in front; the wrist longer and broader than the elongate hand, narrowing a little distally, with six or seven groups of small spines near the smooth, slightly convex front margin; the hind margin tending to concave, set all along with groups of spines, about fourteen groups or pairs of groups, the spines of different lengths in each group, some near the apex of the joint of very great length, finely pectinate; the hand long and narrow, curved, with ten groups of spines on the concave serrate hind margin, the spines varying in length, many of great length and pectinate; the convex front margin has some spines near the apex, and at the apex a group of very long and strong spines, strongly pectinate; the finger is slender, half the length of the wrist, as long as the apical spines of the hand, curved towards the apex, with setules at five or six points of the inner margin, a group near the base of the nail, a dorsal cilium near the hinge, and also three or four setules along the front margin.

Second Gnathopods.—The side-plates rather larger than the preceding pair. The branchial vesicles a little longer and considerably broader than the first joint, much longer than broad. Marsupial plates much longer and broader than the branchial vesicles, and like them with one margin nearly straight, the other convex, the end rounded; there are long setæ all round, but none equalling the greatest breadth of the

plate. The limb closely resembles that of the first gnathopods, but the joints are rather longer and broader, and the spines on the hand are stronger and more numerous.

First Peræopods.—The side-plates broader than the preceding pair, the hind margin ending in a slightly produced point. The branchial vesicles about as long and broad as the first joint. The marsupial plates more than twice as long as the branchial vesicles, with a breadth more than half the length, the longest of the surrounding setæ scarcely equal to half the breadth. The first joint almost free from the side-plate, the front margin a little sinuous, with some spines near the apex, a second margin in front forming a lobe at the lower part of the joint, on the lower rim of which there are spines; the hind margin has three or four groups of spines; the second joint is short, with three spines at the apex behind; the third joint is much shorter than the fourth, widening a little distally, with spines at the apex in front, and at two points of the hind margin; the fourth joint as long as the first, shorter than the fifth, with four groups of spines on the front and three on the hind margin; the fifth joint with several groups of spines on both margins; the hind margin interrupted at a little distance above the apex, and armed with some stout spines, of which one is very prominent, fitted for the impinging of the finger; the apex itself has a stout spine and some small ones; the finger is short and stout, little more than a third the length of the fifth joint, the nail curved, acute; there are small setules along the outer margin and some submarginal to the inner border. There is no appearance of gland-cells in the limb or of any opening in the finger-tip.

Second Peræopods.—The side-plates broader than the preceding pair, with convex front margin ending in a rounded apex, the hind margin produced more deeply in a triangular apex, the lower margin between these two apices being concave. The branchial vesicles rather larger than in the preceding segment. The marsupial plates distally of immense breadth, the surrounding setæ short. The limb is broken; the three remaining joints are similar to those of the first peræopods; it can here be seen that the apex of the front margin in the third joint is emarginate.

Third Peræopods.—The side-plates broader than the preceding pair; the front lobe somewhat squared, but with a convex front and sinuous lower margin; the hind lobe tending to triangular, the combined front and lower margin carrying some spinules, the hind margin sinuous. The branchial vesicles greatly dilated, nearly as broad as long. The marsupial plates, or at any rate one of them, much narrower than the branchial vesicles, not once and a half as long. The first joint of the limb not winged, but tolerably broad, the front margin convex, with five groups of spines, the hind margin double, one smooth, and slightly concave except at the top, the other carrying two groups of spines; the second joint short; the third similar to that of the preceding peræopods, and having, as they also appear to have, a lobe behind higher up than the apex; the other joints missing.

Fourth Peræopods.—The side-plates narrower than the preceding pair, the front lobe

with several slender spines at the top of the front margin and shorter ones below and on the rounded corner, the lower margin straight; the hind lobe of about the same depth as the front, with one or two small spines; the lower margin makes almost a right angle with the hind margin. The branchial vesicles oval, about as broad as the first joint, rather shorter, the neck bent. The three first joints of the limb similar to those of the third peræopods, but with some long spines projecting from one of the hind margins, and the third joint rather longer than in the preceding pair; the other joints missing.

Fifth Peræopods.—Side-plates small, not bilobed. Branchial vesicles very small, oval, with a triangular attachment, the upper end the broader. The first joint a great deal longer and broader than the branchial vesicle, with four groups of spines on the convex front margin, winged at the back, the hind margin of the outer surface being lobed at the top, acutely pointed below and produced so as to overlap the second joint; a smaller less acute process of the oblique lower margin also a little overlaps the short second joint; the third joint is longer than in the preceding pair, and has spines at some four points of each margin, those behind being the stronger; the other joints are missing.

Pleopods.—The coupling spines small, straight, the slender shaft springing from an abruptly broader base and carrying on one margin three or four hooks in a row below the apical one, on the other about seven little teeth or serratures; the large first joint of the inner ramus has from eleven to thirteen plumose setæ along its inner margin, of which in one pair the two uppermost, in another three, in another five, are not cleft, while the following two or three become cleft spines with very unequal arms, and the remainder have flexible terminations; it is here, not as usual the shorter, but the longer arm of the cleft, which has the termination like the hand of a clock, though the expansion is very slight; the joints of the rami are twelve to thirteen for the inner, fourteen to fifteen for the outer, which is also rather the longer ramus.

Uropods.—The peduncles of the first pair longer than the rami, with many marginal spines, and pectinate edges; the outer ramus shorter than the inner, both fringed with several spines along both margins, those on the inner the longer; both with a group of apical spines and with the edges pectinate except near the base; the second uropods like the first, their peduncles and inner ramus reaching nearly equally far, the outer ramus of the second pair rather shorter than that of the first, the peduncles not quite so long as the inner ramus; the peduncles of the third pair longer than the telson, shorter than the outer ramus, not reaching so far back as the other peduncles, the margins carrying some little spines or spinules, the inner produced much beyond the outer, with the apex rounded; the outer ramus is a little longer than the outer ramus in the other pairs, with five spines on one margin, six on the other, and one or more on the apex; the inner ramus is missing in our specimen, but the muscles of the peduncles testify to its existence.

The Telson is small, about as broad as long, the sides parallel for more than half the

length, then converging to a broadly rounded apex, with a setule on either side; each lateral margin carries a small seta and setule where the convergence begins, and there are two setæ and a setule upon the surface not far from each straight lateral margin.

Length.—The specimen, in the position figured, measured, from the front of the head to the extremity of the uropods, half an inch.

Locality.—Station 161, off Melbourne, April 1, 1874; depth, 33 fathoms; bottom, sand. One specimen, female, with the eggs in a forward state of development.

Remarks.—The specific name is given in honour of the distinguished founder of the genus *Icilius*, with a view also to call attention to the resemblance between this species and the type-species *Icilius ellipticus*. From *Icilius australis*, Haswell, this species is distinguished by the produced dorsal point of the seventh peræon-segment and the first two pleon-segments, by the length of the hand in the first peræopods, and other particulars. In regard to the third uropods, Mr. Haswell says, "Inner ramus of sixth pleopoda foliaceous, outer small, long ovate." The figure[1] of these uropods would in some degree correspond with the third uropods of the present species, if the figure of those appendages in Pl. CXXXIII. were reversed and the outer ramus thus made the inner, with a minute outer ramus supplied; but the uropods in my figure are, I think, drawn in their natural position, and the cavity in the produced end of the peduncle suggests the attachment of something more than a minute ramus.

From Dana's *Icilius ellipticus*, two lines long, "brought up on corallines in thirty-one fathoms" at Balabac Passage, north of Borneo, the present species differs in not having a produced point on the third pleon-segment, in having the head less produced in front and at the sides, the maxillipeds much more strongly unguiculate, if this may be judged from the fact that Dana's figure of the maxillipeds does not show a nail at all. Dana regards the upper antennæ as "non-appendiculatæ"; but it is possible that he overlooked the small secondary flagellum, or that it was accidentally missing. He describes the second joint of the upper antennæ as "a little longer than third," and figures it in accordance with the description; he figures the second and third joints of the mandibular palp as subequal, and gives only two setæ to the inner plate of the first maxilla. Of the uropods he says, "The three pairs of stylets are rather long, and extend back some distance. The branches of the last pair are quite unequal." In his figure these branches are indistinct, the inner shorter than the outer, but not minute.

Genus *Chosroës*, n. gen.

Near to *Icilius*.

Upper Antennæ without secondary appendage.

The third joint of the mandibular palp longer than the second.

[1] Catalogue of the Australian Stalk- and Sessile-eyed Crustacea, pl. iv. fig. 4, 1882.

Outer plates of the *Maxillipeds* not reaching beyond the middle of the palp's second joint.

Hands of both pairs of *Gnathopods* subchelate, not linear.

The *Third Uropods* with long equal or subequal rami.

The generic name is that of an Armenian king, of whom an account may be found in Gibbon's Decline and Fall of the Roman Empire.

Chosroës incisus, n. sp. (Pls. CXXXIV., CXXXV.).

Rostrum minute; body broad-backed, especially at the centre of the peræon, thence narrowing towards the pleon, the last three segments of which are ventrally flexed; the fifth segment of the pleon shorter than the sixth.

Eyes broadly oval, with many scores of narrow ocelli; their position is close to the lower margins of the head, and very near the two lateral points where the front margin, which is concave on each side of the rostrum, joins the convex lower margins.

Upper Antennæ.—The first joint much thicker than the second, not so long as the second and third united, with a small spine on the lower apex; the second joint longer and thicker than the third; the flagellum much longer than the peduncles, with thirty-four joints remaining, the joints not long, widening a little distally, each having several small narrow calceoli, at intervals armed with groups of long and broad cylinders; the second and third joints of the peduncle likewise having calceoli, there being not fewer than a dozen round the apex of the third joint; the appearance presented by the calceoli being as if four stalked cups were planted one within the other, the basal cup smaller than the next, and the two following smaller than the basal.

Lower Antennæ.—The first two joints very short, the third also short, widening distally, the fourth longer than the third, and the fifth than the fourth, all three having a few spines and small calceoli; the flagellum stout, with twenty-four short broad joints remaining, furnished with small calceoli.

Upper Lip.—Distal margin evenly convex, as observed in the small specimen.

Mandibles.—The cutting edge angled, divided into seven teeth; the secondary plate of the left mandible divided into a row of five teeth, the plate on the right mandible smaller, appearing in profile to have two narrow teeth, but in a broadside view rather to end in two laminæ, one much wider than the other; the spine-row of five spines; the molar tubercle prominent, with long teeth round the dentate crown, cilia on the side, and a plumose seta; there is a process near the base of the palp, such as is found in so many genera; the palp very large, the first joint short, the second both broad and long, with many spines along the front margin, including five in a row near the base, of which the uppermost is the longest, and a group of about fifteen set in a curve on the distal part of the outer surface, the central the longest; there are others between these

groups, most or all being feathered; the third joint is longer but narrower than the second, much curved, nearly the whole extent of the concave front margin being closely fringed with long and short feathered or pectinate spines, the longer ones being submarginal in origin; there is a dense group of not very long spines on and below the narrow truncate apex, and close to the base of the outer margin there are two on the outer surface.

Lower Lip.—The principal lobes broad, distally rounded; the inner lobes appearing to be scarcely separated from the principal; the mandibular processes small.

First Maxillæ.—The inner plate with two strong plumose setæ on the narrow oblique apical margin just below the pointed apex, on which, in the small specimen, one maxilla has a third seta; the inner margin much ciliated; the outer plate having eleven strongly denticulate spines on the apical margin, one row of five with numerous small denticles, from four to seven in number, the other row of six rather stouter with stronger denticles, two or three in number; the first joint of the palp a little longer than broad, the outer margin longer than the inner, the second joint reaching considerably beyond the outer plate, with very convex outer margin, the distal margin carrying seven serrate spine-teeth, the outermost the longest, and one submarginal setiform spine; in the small specimen there are only four spine-teeth.

Second Maxillæ.—The outer plate shorter than the inner, each with numerous strongly feathered spines round the apical margin; a few shorter spines are on the outer margin of the outer plate below the apex, and some larger plumose setæ longer than the spines on the inner margin of the inner plate.

Maxillipeds.—The inner plates not nearly reaching the distal end of the palp's first joint, with plumose setæ on the inner margin, three spine-teeth and some feathered spines on the distal margin; the outer plates scarcely reaching the middle of the second joint of the palp, the inner margin without spine-teeth, but fringed with some eighteen pairs of slender submarginal spines; without break in the series of spines, beyond the apex of the inner margin, the distal margin has its curve set with eight strong feathered spines; the first joint of the palp is not especially short, and has several groups of spines on the inner margin, and a group at the apex of the outer; the second joint is not twice as long as the first, densely fringed with spines on the inner margin, having also two groups on the inner surface, and three on the outer margin; the third joint is narrower but nearly as long as the second, the distal half buried in successive rows of spines; amidst those round the apex a short finger with a short sharp nail dimly appears with several spinules along its inner margin near the nail. In the fig. *mxp.*, on Pl. CXXXIV., the palps appear to have five joints, but the line which divides the outer plate from its base, though it represents an actual thickening of the joint along the line of the muscles, should have been omitted, as it is misleading.

The *triturating organs* of the stomach show an outer row of short, strong, acute,

slightly bent spines, within which is a row of longer spines, straight and strong, and apically denticulate, the series being continued by spines that are much more slender.

First Gnathopods.—Side-plates small, directed a little forwards, with a spine on the lower margin. First joint reaching much beyond the side-plate, not much longer than the hand, the distal half wide, the front margin nearly straight, the inner surface having a few long setæ, each apex carrying some slender spines; the second joint of equal length and breadth, with one or two slender spines at the middle of the hind margin, and a long row round the apex of it; the third joint rather longer, with several groups of spines round the hind margin and across the pointed apex, and one on the convex front margin; the wrist subequal in length to the hand, but not so broad, broadest at the centre, with spines at the apex of the front margin, the hind margin closely fringed with numerous spines, the inner surface carrying two oblique rows, one composed of three or four groups passing from the hind margin to the distal; the hand oval, narrowest at the base, with six groups of spines along the serrate hind margin, the front margin with two or three groups, and the inner surface having seven or eight large groups distributed about it; the palm gently convex and slightly oblique, joining the hind margin by a gentle curve, a row of about ten palmar spines being set, some on the inner, some on the outer, surface at the junction; the palm is fringed with submarginal slender spines; the finger tolerably broad, with smooth inner edge fitting evenly over the smooth edge of the palm, and not projecting beyond it; a small dorsal cilium near the base; almost all the spines that have been mentioned, except those of the palm, are finely pectinate.

Second Gnathopods.—Side-plates deeper than the preceding pair, with the lower margin evenly convex and carrying a spine at the hinder corner. (They are twisted out of their true position in the figure.) The branchial vesicles elongate, widening distally, longer than the first joint. The marsupial plates extensive, far wider and longer than the branchial vesicles, surrounded by setæ, not as long as the greatest breadth of the plate. The limb closely resembling that of the first gnathopods, but more elongate, the wrist longer than the hand, and the numerous spines of its hind margin showing in many cases a far stronger pectination.

First Peræopods.—The side-plates much broader than the preceding pair, broader below than above, with the hind margin concave, a spine on the rounded lower corner. The branchial vesicles a little longer than the first joint. The marsupial plates as in the preceding segment. The first joint reaching much below the side-plate, with the hind margin smoothly convex, carrying a few apical spines, the front margin dilated into a winged lobe near but not at the apex, with two spines at its distal end, the inner margin a little dilated at the upper part, then straight, with an apical group of spines; the second joint short, with spines at the apex behind; the third joint much shorter than the fourth, widening distally, with two small groups of spines on the hind margin, stronger spines at

two points of the front margin, and a group on its decurrent apex; the fourth joint shorter than the fifth, rather wider above than below, with small spines at three points of each margin; the fifth joint slightly curved, with small groups of spines at three points of the concave hind margin, spinules at four points of the convex front, and spines at its apex; the finger short, with a strongly feathered dorsal cilium close to the base.

Second Peræopods.—The side-plates broader than the preceding pair, the front margin very convex instead of almost straight, the long lower margin straight, the hind margin deeply excavate, the rounded lower portion carrying two spines. The marsupial plates of great breadth, with one margin almost straight, the other very convex, and the distal end somewhat truncate. The limb as in the first pair so far as observed; the fifth and sixth joints missing.

Third Peræopods.—The side-plates much broader than deep, the front and hind margins convex, the two lobes very distinct, of about equal depth, the front one with a spine at the front corner, its lower margin rounded, the hinder with an irregularly angled lower margin carrying two spines. The branchial vesicles longer than the first joint but not so broad. The marsupial plates a little smaller than the preceding pairs, with broadly rounded distal margin. The first joint a little longer than broad, the front margin carrying three groups of pectinate spines, the hind margin at the upper part convex, slightly notched for a few setules, below the middle having as it were a triangular piece cut out; the lower margin sinuous, projecting behind considerably beyond the second joint; apart from the wing the hind margin on the inner surface is nearly straight and would give a broad joint narrowest at the top and there fringed with several long spines; the short second joint has some apical spines; the third joint is much shorter than the fourth, with a narrow neck, then much widened, having on the front two groups of several small spines, and behind three or four large groups, that on the slightly decurrent apex including very many spines; the fourth joint, with the margins nearly parallel except at the base, has four groups of spines on each, those behind being the longer; the fifth joint a good deal longer and narrower than the fourth, has five groups of spines on each margin; the finger is short and narrow, not a third the length of the fifth joint.

Fourth Peræopods.—The side-plates not so broad as the preceding pair, the front margin nearly straight, with a spine at the apex, the lower margin of the front lobe convex; the hind lobe produced below the front one, with its hind margin straight, its inner nearly so, and the lower angled, carrying two spines. The limb broken, the three remaining joints like those of the third peræopods, but larger, the inner hind margin of the first joint forming an obtuse angle and showing no spines, the third joint having five groups of spines on the hind margin.

Fifth Peræopods.—The side-plates smaller than the preceding pair. The limb apparently similar to that of the fourth peræopods. A fragment of a limb, probably

belonging to this pair, had on the hind margin of the fourth joint seven groups of spines and five on the front; the more slender and not much longer fifth joint had eleven groups behind and six in front; the finger not a fourth the length of the fifth joint.

Pleopods.—Coupling spines small, the apex sharp, its retroverted hook distally broad; there is another hook below it still broader; in each case the hook seems to stretch across the shaft, instead of forming a pair of lateral hooks, as is more usual; there are five cleft spines on the pair of pleopods examined, the same pair having nineteen joints to the outer ramus and eighteen to the inner.

Uropods.—The peduncles of the first pair considerably longer than the rami, with a spine at the apex of one of the upper margins and three on the distal part of the other; the outer ramus shorter than the inner, each with numerous spines along the margins, and a group at the blunt apex; the peduncles of the second pair subequal in length to the inner ramus, with spines at five points of one of the upper margins, one, two, or three together; the outer ramus shorter than the inner, with five spines along the inner margin and five elongate groups along the outer margin, numbering three, five, six, six, two, in the respective groups; there is besides an apical group; the inner ramus has seven spines along the inner margin, eight groups along the outer, and an apical group; the peduncles of the third pair are shorter than the rami, reaching beyond the peduncles of the other pairs, with a group of spines at the outer apex; the rami broad, lanceolate, equal in length, a little shorter than the inner ramus of the first pair, longer than the other rami, the inner with numerous spines and feathered setæ along each margin, the outer with spines and setæ along the inner margin, and groups of spines intermingled with some single spines along the outer margin; both with serrate margins and the apex acute.

The Telson elongate, about as long as the peduncles of the third uropods, widest at the base but almost immediately narrowing, not twice as long as the greatest breadth, but more than twice as long as the breadth below; the apical border with a triangular emargination, a little way above which on either side a dentate line upon the surface carries four large spines with accessory threads and a cilium; of the apices on either side of the emargination one is rounded and has two submarginal spines, the other is more acute and shows but one spine.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the middle of the third pleon-segment, seven-twentieths of an inch.

Locality.—Station 314, near Cape Virgins, January 21, 1876; lat. 51° 35′ S., long. 65° 39′ W.; depth, 70 fathoms; bottom, sand; bottom temperature, 46°. One specimen, female.

Station 313, off Cape Virgins, January 20, 1876; lat. 52° 20′ S., long. 67° 39′ W.; depth, 55 fathoms; bottom, sand; bottom temperature, 47°·8. One small specimen, young.

Remarks.—The young specimen is the subject of Pl. CXXXV.; its length, from the rostrum to the extremity of the second segment of the pleon, is less than one-tenth of an inch; the figures will, I think, sufficiently show, without a detailed description, that the differences between the smaller and larger specimens are only such as might be expected between a very young specimen and an adult; in the young the spines are fewer on the palp of the first maxillæ, on the maxillipeds, gnathopods, uropods, &c.; the telson is much shorter in proportion to its length; the pleopods have a single cleft spine, and only four or five joints to the rami; the third uropods are not lanceolate. The latter difference recalls the still more remarkable divergence between the third uropods of the young and of the adult in *Amathilla homari* (Fabr.), better known as *Amathilla sabini* (Leach), a divergence which was pointed out by Bruzelius in the Skand. Amph. Gamm., p. 51, 1859, and further noticed by Buchholz, in Die zweite deutsche Nordpolarfahrt, in 1874.

The specific name refers to the peculiar hind margin of the first joint in the third and following peræopods. It is a curious coincidence that, after the capture of a single specimen of the young of this new species at one station, at the very next station, but much more than a hundred miles away, a single specimen of the adult should have been obtained. The two large specimens of *Andania gigantea* from far greater depths present a similar coincidence that is even more striking.

Family Helaidæ.

In 1872 Boeck named the Helainæ as second subfamily of the Corophiidæ, and in 1876 defined it as follows:—

"*Mandibles* with the third joint of the palp shorter than the second.

"*Maxillipeds* with the outer plate armed on the inner margin with few but strong teeth.

"The body slender, depressed; the side-plates tolerably small.

"*Antennæ?*[1]

"Legs rather elongate; *First Gnathopods* larger than the *Second.*

"Last three pairs of *Peræopods* graduated in length, the hinder the longer; the first joint not dilated, linear; the fourth joint very small.

"*First* and *Second Uropods* biramous, the *Third* uniramous."

This definition Boeck had given in 1870 as that of the genus *Hela*, and in his later work, the definition of the subfamily is allowed to stand for the character of the single genus contained under it. Sars in 1882 relinquishes the subfamily Helainæ altogether, including its one genus under the family Corophiidæ.

[1] Both pairs very long; upper with secondary flagellum, see Hansen, *loc. cit.*

Genus *Neohela*, S. I. Smith, 1884.

1860. *Hela*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 668.
1870. „ Boeck, Crust. amph. bor. et arct., p. 180 (260).
1875. „ Metzger, Zoologische Ergebnisse der Nordseefahrt, p. 299.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 643.
1881. *Neohela*, S. I. Smith, Proc. National Museum, Washington, vol. iii. p. 448.
1882. *Helella*, Sars, Oversigt af Norges Crustaceer, p. 31.
1886. *Hela*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 495.
1887. *Neohela*, Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 168.

For the original description of the genus, see Note on Boeck, 1860 (p. 325). S. I. Smith, in substituting a fresh name for the preoccupied *Hela*, does not give an independent definition of the genus, but supplies some notes on the new species *Neohela phasma*. "The antennulæ," he says, "are much longer than the rest of the animal; the first segment of the peduncle is nearly as long as the width of the head; the second segment is much more slender than the first and more than three times as long; the third segment is more slender than the second and considerably longer than the first; there is a well-developed secondary flagellum, as long as the third segment, and composed of about nine slender segments; the primary flagellum is very slender and about one and a half times as long as the peduncle. The third segment of the peduncle of the antenna just reaches the distal end of the first segment of the peduncle of the antennula; there is a small spiniform tubercle on the outside of the first segment, in line with the lateral spine of the head and the spiniform anterior angles of the first and second epimera. The distal portion of each antenna is wanting in the single specimen examined."

The very imperfect specimen, which I have provisionally named *Neohela serrata*, leaves me unable to speak with anything like decision on the proper position of the group.

Neohela serrata, n. sp. (Pl. CXXXVI.).

Rostrum short; lateral lobes of the head small, not produced so far as the rostrum; the animal elongate, somewhat compressed, the back rounded; the side-plates all shallow; the first three segments of the pleon much longer than any of the peræon-segments, the postero-lateral angles of the first with a scarcely perceptible point, of the second more decidedly acute, of the third prominently so; the first five segments of the pleon have the hind margin dorsally dentate with sharp teeth, for the most part alternately longer and shorter, numbering about ten on the first segment, six on the fifth, and fifteen on the other three which have a prominent central tooth, particularly strong on the third pleon-segment; there are setules between the teeth; the fourth segment is longer than any of the peræon-segments; the sixth is produced backwards into long sharp points below on either side of the telson.

Eyes doubtful, apparently small, round, composed of few ocelli, situated on the lateral lobes of the head.

Upper Antennæ.—First joint rather thick, longer than the head, narrowing a little distally, and carrying a few spinules; the second joint longer and thinner, with a comparatively long spine high up on the surface and another at the apex, and having the surface, at least on one side, studded with rows of spinules, besides having in common with the first joint a generally roughened hairy appearance all over. The other joints missing.

Lower Antennæ.—First two joints very short, the gland-cone short, decurrent; the third joint rather stout, longer than the united first and second, carrying a few spines and spinules. The other joints missing.

Upper Lip with the distal margin not quite symmetrically emarginate, the round tract on either side of the emargination carrying some short spine-like cilia directed inwards.

Mandibles.—The cutting edge divided into six or seven teeth, the most prominent not being the outermost; the secondary plate of the left mandible (on the right of the Plate) is divided into four strong teeth; on the right mandible this plate is less stout, with small teeth; the spines of the spine-row vary in number from seven and eight on one specimen to ten and eleven on the other, all appearing linear when seen edge-ways, but those near the cutting plates having in reality a broad shaft, widening for some distance from the base, and then rather abruptly narrowing to a serrate linear termination; the molar tubercle large and prominent, with some strong teeth round part of the rim of the dentate crown, a plumose seta and (observed only in one specimen and only in the right mandible) a small dentate process on the outer side of the trunk of the tubercle; the palp is long, the first joint short, scarcely longer than broad; the second joint elongate, with many lightly feathered spines along the inner margin and on the surface; the third joint shorter than the second, but nevertheless elongate, with the outer margin convex, the inner nearly straight, carrying long feathered spines at intervals, the almost acute apex having two or three; there are also spines along the surface, most of which are smaller than the marginal spines.

Lower Lip.—The outer and inner lobes and mandibular processes not showing any striking peculiarities, but not well enough observed for description.

First Maxillæ.—The inner plate with nine or ten very long plumose setæ on the sinuous inner margin; the outer plate with ten spines on the truncate distal border, the innermost spine straight, with some minute lateral teeth, the next shorter, with a small denticle on the outer side, the following pair similar to these two; in the centre there are two, which each have a short and a long lateral denticle on the inner margin, while between them in the adjacent row is a longer spine which has only little teeth if any; of the three outermost spines, which as usual are rather stronger than the rest, one

has a single lateral denticle, one has some minute teeth, and one appears to be unarmed; the first joint of the palp is short; the second joint widens distally and on the dentate distal margin carries seven spine-teeth, and has seven setiform spines submarginal to these.

Second Maxillæ.—The outer and inner plates nearly equal both in length and in breadth; the inner with twelve plumose setæ in a series beginning near the base of the inner margin and curving towards the outer apex, also having a series of spines beginning below the middle of the inner margin and passing most of the way round the apex; the outer plate with longer spines round the apex, except the three outermost which are slight, the subapical series beginning a very little way down the inner margin.

Maxillipeds.—The inner plates reaching beyond the first joint of the palp, having plumose setæ on the inner margin, three strong spine-teeth and several feathered spines on the rather broad dentate distal margin, and a hooked spine-tooth near the apex of the inner margin; the outer plates reaching beyond the middle of the second joint of the palp, the lower part of the inner margin smooth, though having the slender spines on the surface projecting beyond it, the distal part gently crenate, set with six spine-teeth, the distal margin almost truncate, serrate, with four spines, of which the outermost is setiform; the first joint of the palp unusually short, with a setiform spine on the inner apex; the second joint long and slender, not very broad, with a setiform spine on the outer apex, and many such spines along the inner margin; the third joint twice as long as the first, with spines round the inner and apical margins and on the distal part of the surface and outer margin; the finger slender, not so long as the third joint, with a long spiniform nail and two setæ at the base of the nail on the inner side; the dorsal cilium very long, close to the hinge.

The *triturating organs* of the stomach do not appear to have any of the spines very strong.

First Gnathopods.—Side-plates below much broader than the depth, the lower margin nearly straight, serrate, forming with the oblique front margin a strongly produced acute angle. The first joint attached at the lower hind corner of the side-plate, with spines along both margins, set at a little distance from the edge; the second joint short, with some spines at the apex behind, the third joint longer than the second, with spines at four points of the straight hind margin, and groups across the distal margin, some of the spines in which are both long and strongly pectinate on two edges; the wrist about as long as the first joint and except at the two ends much wider, the long front margin slightly convex, having five or six groups of spines on it or closely adjacent; behind, the wrist attains its greatest width abruptly on leaving the third joint, and then, at an angle with the smooth margin by which this is attained, the convex and irregularly denticulate hind margin runs to the junction with the hand, the wrist gradually narrowing, bordered with long and strong pectinate spines, and having others planted

singly or in pairs along the surface; the hand, a narrow oval, as long as the wrist but not so wide, with six groups or rows of long pectinate spines adjacent to the front margin; the hind margin a little serrate, with a few long slender spines and some spaced palmar spines; at a little distance from the hind margin are some slender feathered spines, the groups being close set near what may be reckoned as the palm-border, of which the portion nearest the hinge is almost straight or tending to concave; the finger is slender, about half the length of the hand, the outer margin convex, with a long dorsal cilium close to the hinge, the inner margin nearly straight as far as the nail and set with several setules, the nail about one-third the length of the basal part of the finger.

Second Gnathopods longer than the first, but with a narrower wrist. The side-plates with the breadth and depth equal. The first joint longer than in the preceding pair, but scarcely so wide; the second and third joints narrower than in the preceding pair, the third with fewer spines and the apex acute; the wrist very elongate, yet scarcely so long as the first joint, its greatest width much nearer the distal end than the base, with spines at seven points of the slightly convex front margin, and five or six large groups of long pectinate spines on the serrate hind margin, besides slighter spines on the surface, and on the oblique distal part of the hind margin; the hand in general form is a long narrow oval, shorter than the wrist, but longer than the hand of the first gnathopods, which it much resembles in armature, though the front margin is more lightly spined, the hind margin is not serrate or scarcely so, and the palm is pretty distinctly marked by a shallow concavity, over which the finger curves, leaving a narrow elliptical space between its inner margin and the palm; the finger resembles that of the preceding pair, except in having its inner margin more concave.

First Peræopods.—The side-plates like the preceding pair. The marsupial plates narrow, shorter than the elongate first joint of the limb.

Second Peræopods.—The side-plates rather broader above than in the preceding pair. The first joint long and narrow, with some slender spines at intervals along the hind margin, and some spinules on the front; the second joint quite short, with some small spines at the apex behind; the third joint thinner than the first, but very little shorter, with spines of very different lengths and spinules at seven or eight distant points of the slightly concave and serrate hind margin, and at five points of the slightly convex front; the fourth joint very elongate, but thinner and shorter than the third, with spines and spinules at six points behind and five in front; the fifth joint elongate, thinner than the fourth, carrying some spinules; the length not determined, the joint being broken.

The other peræopods were missing. One or two of the branchial vesicles were observed to be broadly oval.

Pleopods.—The peduncles long, distally produced in a small acute process which seems to coalesce with the first joint of the outer ramus; the peduncles, at least in the

third pair, had numerous marginal spines; the coupling spines are long and slender, with a sharp apical pair of retroverted hooks, another slender pair just below, and a little further down two more hooks unsymmetrically placed; the cleft spines were observed to be five in a series on the first pair, four on the third, with long unequal arms, the inner margin of the longer arm distinctly serrate; the joints of the rami number from twelve to fourteen; the outer ramus is perhaps slightly the longer.

The Telson is long and narrow, deeply cleft, the outer lateral margins converging, but the apices being broken it could not be determined what acuteness was attained.

The Uropods were all broken.

Length.—The specimen, in the position figured, measured, in a straight line from the rostrum to the extremity of the broken telson, three-tenths of an inch.

Locality.—Station 149H, off Cumberland Bay, Kerguelen Island, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. Two specimens. One of the specimens was certainly a female, as the marsupial plates were present. From this the figures marked A in the Plate were taken; the remainder from the other specimen.

Remarks.—The specific name refers to the ornamentation of the pleon.

In the imperfect state of the specimens the genus must remain to a certain extent doubtful, but there is sufficient likeness between this species, so far as it can be made out, and *Hela monstrosa*, Boeck, to justify their being, at least provisionally, placed side by side. Boeck says of his species that the mandibular palp is short, and that the spine-row consists of two spines.

Family LYSIANASSIDÆ (see p. 606).

Genus *Kerguelenia*, n. gen.

Mandibles with the long three-jointed palp attached to the extreme front of the trunk; cutting plates, spine-row, and molar tubercle wanting.

First Maxillæ.—The inner plate apparently rudimentary or wanting; the outer plate carrying five short spines; the palp broad, two-jointed.

Maxillipeds.—The inner and outer plates small, the palp four-jointed, very long and slender.

Lower Antennæ.—The third joint of the peduncle as long as the fourth.

First and *Second Gnathopods* slender, having the second joint and wrist elongate; the first gnathopods neither chelate nor subchelate; the second gnathopods minutely chelate.

The *Third Peræopods* with the first joint scarcely expanded; the *Fourth* and *Fifth Peræopods* with that joint expanded widely.

The *First* and *Second Uropods* biramous, the first extending much beyond the second; the *Third Uropods* small, uniramous.

Telson doubtful, probably very small, undivided.

The name of the genus is taken from Kerguelen Island, which the Challenger Expedition has shown to be a locality of notable interest with regard to the Amphipoda. From Boeck's definition of the Lysianassinæ this genus differs in the formation of the mandibles, the tenuity of the maxillipeds, the want of the brush on the first joint of the flagellum of the upper antennæ; in not having the first joint of the third peræopods dilated, and in having the fifth peræopods shorter instead of longer than the fourth. But in the maxillipeds it agrees with the new genus *Sophrosyne*, next to which for this reason I propose to place it; it agrees with *Menigrates obtusifrons*, Boeck, in the character of the upper antennæ, so far as can be judged from Boeck's own description and figure, and with the same genus in the relative length of the two last pairs of peræopods. From *Acontiostoma*, of which it is in respect to the gnathopods and some other points suggestive, it is widely removed by the character of the maxillipeds and the position of the mandibular palp. The general character of the antennæ, the peculiarities of the gnathopods, the shape of the deep side-plates, as indeed of the whole animal, and the peræopods, all clearly point to the inclusion of the genus in the family Lysianassidæ, although the structure of the mandibles must give it rather the air of an intruder.

Kerguelenia compacta, n. sp. (Pl. XVA.).

A compact little species, discovered among the Hyperina too late for the description to be inserted in its proper place; in outward appearance it resembles the Stenothoidæ even more than the Typhidæ; of the peræon-segments the fifth is the longest and deepest; the third pleon-segment has the postero-lateral angles almost right angles, the fourth pleon-segment is elongate, as long as the third; the fifth is very short, the sixth narrow, longer than the fifth. Colour of the specimens preserved in spirits, a light brown.

Eyes not perceived, but not certainly absent.

Upper Antennæ.—The first joint thick, not much longer than broad, carrying three feathered cilia; the second joint rather longer than broad, much narrower and shorter than the first, carrying one feathered cilium; the third joint shorter and narrower than the second; the flagellum of five little joints, successively narrower, together not so long as the first joint of the peduncle, the second with an apical filamentary cylinder, the last with some minute setules; the secondary flagellum consisting of three joints, which are rather longer than the first three of the primary.

Lower Antennæ.—The first joint a little expanded, closely coalesced with the second,

of which the gland-cone is minute; the third joint a little bent, widest at the base, longer than the two preceding united; the fourth joint narrower than the third, which it equals in length, somewhat bent; the fifth joint shorter than the fourth; the flagellum tapering, of four or five joints, successively shorter, all of them together not equal to the last two joints of the peduncle.

Mandibles.—The trunk somewhat curved, narrowing to the distal end, at which the palp is attached, and apparently not fitted to serve any other purpose than that of holding the muscles which move the palp; first joint of the palp very short, second long, unarmed, third more than half the length of the second, with five setiform spines on the distal part and apex of the inner margin.

First Maxillæ.—The outer plate carrying on the oblique apical margin five very short spines or spine-teeth, serrate on the inner edge; the palp far outreaching the outer plate, its first joint as broad as long, more than half the length of the second joint, which has two little spines on the broad slightly indented apical border.

Second Maxillæ.—The inner plate shorter and narrower than the outer, with four setæ on the rounded apex; the outer plate similar in form to the inner, with twice as many setæ or spines on or near the apical margin.

Maxillipeds.—The inner plates reaching about to the middle of the first joint of the palp, the apical margin sloping outward, carrying two little spines; the outer plates reaching about to the end of the first joint of the palp, with four setules or spinules on the inner and apical margins; the first joint of the palp rather elongate yet less so than any of the three following joints, which are subequal in length, but the third rather longer than the second or the narrow tapering fourth; two or three apical setules constitute the whole armature of the palp.

First Gnathopods.—Side-plates deep, the anterior margin an arc of a circle with the hind margin for its chord. The first joint attached rather above the centre of the hind margin of the side-plate, not reaching the lower border, its margins nearly parallel, unarmed; the second joint more than half the length of the first, as long as the wrist; the third joint shorter than the second, its hind margin much longer than the front, ending in a pointed apex closely adpressed to the wrist; the wrist a little longer than the hand, its front margin longer than the parallel hinder one; the hand narrow, tapering, with two or three tiny setules on the distal part of the hind margin; the finger very small, a little curved, having in a serration of the hind margin a feathered setule as long as the finger itself, standing out at an angle from it, and followed by a much smaller setule in another serration.

Second Gnathopods.—Side-plates a little longer and rather less broad than the preceding pair. The first joint attached as in the first gnathopods, but longer than in those, about reaching the lower border of the side-plates, the lower half wider than the upper; the second joint more than half as long as the first, not quite so long as the

wrist; the third joint much shorter than the second, flask-like, with the bulb at the distal end; the wrist much longer than the hand, with numerous setæ on and near both margins; the hand not so long as the second joint, an elongate oval, distally sharpened so as to form a little blunt palm process from which a setule projects, and against which lies the minute finger with its strongly bent tip, forming a microscopic chela; the sides of the hand are furred with numerous tufts of setæ, and at the distal end of the front margin there are the spines usual in the Lysianassidæ overarching the finger. These spines were damaged, so that the pectination which might be expected could not be observed.

First Peræopods.—Side-plates broader and deeper than the preceding pair, the hind margin slightly concave. The first joint attached considerably above the centre, not nearly reaching the lower border of the side-plate, widening a little from the base; the second joint short, the third distally widened, longer than the fourth, the front apex a little produced downwards; the fourth joint abruptly narrower than the third, at the hinder apex of which it is attached, slightly curved, with three spinules on the concave hind margin; the fifth joint a little curved, subequal in length to the third, with a spinule at the hinder apex; the finger more than half the length of the fifth joint.

Second Peræopods.—The side-plates rather deeper and immensely broader than the preceding pair, the excavation behind being about half the depth, and more than half the breadth of the plate, the hind margin below the excavation rounded. The limb very similar to the preceding pair, the third joint scarcely so much expanded distally, the fourth with a single spinule on the hind margin, the finger rather stouter and much shorter.

Third Peræopods.—Side-plates with the hind lobe deeper than the front, the breadth slightly greater than the depth of the hind lobe. The marsupial plates very narrow, with two apical setæ. Marsupial plates were not observed attached to any of the other limbs. One pair of oval branchial vesicles was seen, but it was not ascertained how many more pairs there were. First joint attached just above the distal margin of the front lobe of the side-plate, a little wider but not longer than the first joint in the preceding peræopods, with a pair of apical spinules on the nearly straight front margin, and a row of three a little higher up, the hind margin convex; the second joint short, with a few spinules on the front margin; the third joint longer and much more dilated than in the preceding peræopods, with four spinules on the front and three on the much bowed hind margin, besides one or two at each apex; the hinder apex acute, completely overlapping the narrow fourth joint, which has a spinule at the middle of the front margin and two at its apex; the fifth joint longer than the fourth, similarly armed, shorter than the corresponding joint in the preceding peræopods; the finger rather more than half the length of the fifth joint; the nail small.

Fourth Peræopods.—The side-plates much deeper than broad, the margins nearly parallel, the hinder longer than the front. The first joint wider than the side-plate, rather longer than broad, the front margin convex, with some spinules along the lower

half, the hind margin nearly straight, carrying a few cilia; the rest of the limb very similar to that of the third peræopods, the finger rather longer.

Fifth Peræopods.—The side-plates a little broader but not quite so deep as in the preceding segment, the hinder margin convex, much longer than the front, the lower margin very convex. The first joint greatly expanded, a little longer than broad, the front margin nearly straight, with two or three spinules on the lower part, the hind and lower margins smooth, curved; the second joint very short, with two or three spinules on the front margin, behind overlapped by the first joint; the third joint much smaller than in any of the other peræopods, with spinules at three points of the front margin, and one on the hind margin, of which the sharp decurrent apex quite overlaps the small fourth joint; the fifth joint shorter than in the preceding pair, but considerably longer than the fourth joint; the finger more than half the length of the fifth joint.

Pleopods.—The peduncles rather widely separated at the bases, with two little oval processes projecting between them. The coupling spines small, with slender shafts, having three or four retroverted teeth on each margin; a single cleft spine on the inner ramus; the inner ramus seemingly with five, and the outer with six, joints.

Uropods.—The peduncles of the first pair longer than the rami; the rami acute, the lower and outer longer than the upper and inner, the lower having two small spines, the upper having one on the proximal half; the peduncles of the second pair about equal in length to the rami, which resemble in shape those of the first pair, but are unarmed, reaching very little beyond the peduncles of the first pair, the lower and outer rather longer than the other; of the third pair the peduncles were not clearly discovered and must in any case be very short; the single ramus of each uropod curved in towards the other, being broader distally than at the base, the two lying apparently under a shallow transparent telson.

Telson not clearly distinguished, seemingly very small, wider than its length, forming a small arc of a circle.

Length from the front of the head to the back of the third pleon-segment, in the position figured, about one-seventh of an inch.

Locality.—Station 149H, off Cumberland Bay, Kerguelen, January 29, 1874; depth, 127 fathoms; bottom, volcanic mud. Two specimens.

Remark.—The specific name explains itself.

Family PARDALISCIDÆ, Sars (see p. 990).

Synopioides macronyx (see p. 1000).

A second specimen of this species, which, like that already described, had been mounted in glycerine during the voyage, was labelled "Townet at trawl, Nov. 1875, 2025 fms., South Pacific." It may be presumed that this belongs to Station 293,

lat. 39° 4′ S., long. 105° 5′ W.; bottom temperature, 34°·4; while the other specimen came from lat. 38° 7′ S., long. 94° 4′ W., the bottom temperature there being 35°·3.

Length, without the antennæ, nine-twentieths of an inch, from the front of the head to the extremity of the first uropods, the second uropods being broken, and the last uropods missing.

Remarks.—While the specimen from Station 295 was a female, the specimen from Station 293 appears to be a male, and the difference of sex may account for certain variations which might otherwise be regarded as of specific value. In the present specimen there is a clearly defined, only slightly depressed, rostrum, with the convex lateral margins meeting in a pointed apex; the third joint of the mandibular palp is not very elongate; the first gnathopods have the wrist almost as long as the hand; the first and second peræopods have a slight convexity of the hind margin of the fifth joint, and the finger almost linear; the peduncles of the first pair of uropods are considerably longer than the rami. Should the foregoing differences be thought to require the institution of a separate species, I propose for it the name *Synopioides secundus*. The following particulars are in all probability common to both forms, although they were not observed or could not distinctly be made out in the specimen first described; the third segment of the pleon is dorsally produced at the centre of the hind margin into a short blunt tooth; the fourth segment a little in advance of the hind margin has a longer acute tooth or process, but the back of this segment being depressed along the centre, a lateral view showing the raised outer margin and the projecting central process gives a bidentate appearance to the segment. The *maxillipeds* have much greater resemblance to those of *Pardalisca* (see Pl. XCIII.) than, from their condition in the first specimen, I was able to perceive; the inner plates are a little less rudimentary than in *Pardalisca*, but they are very small, conical, without spine-teeth, carrying three setæ, one of these being very long and planted on the apex; there are also some setæ on the outer apex of the joint to which the inner plates belong; the following joint is very large, with two setiform spines apart from one another on its outer margin; the outer plates where free from the basal part of the joint are small, not quite reaching to the apex of the first joint of the palp, the outer margin smooth, the apical margin carrying three spines at intervals, curved, graduated in size, the largest outermost; the inner margin has six slender spines distant from one another; the first joint of the palp is longer than broad, with smooth margins; the second is about once and a half as long as the first, with long, plumose spines or setæ, not very numerous, on the inner margin; the third joint is about as long as the second, with setæ on both margins, chiefly near the distal end; the finger is long and tapering, with a setule at the base of the nail; this description of the *maxillipeds* must be taken in correction of that given on p. 1001. The *triturating organs* are of rather peculiar shape, narrow at one end and broad at the

other, the inner margin as it approaches the widened end being set with six or more powerful, strongly projecting spines, graduated in size, the largest at the broad end of the organ, the rounded apical part being set with a fan-like arrangement of slender spines. The fourth peræopods in this specimen were preserved, although, unfortunately, in an imperfect condition; they have the first joint intermediate in size between that of the third and fifth pairs; the third joint much longer than in the third peræopods, rather shorter but broader than in the fifth; the fourth joint longer than the third and longer than in the fifth pair, with spines at five or six points of the front margin, and smaller spines at seven or eight points of the hind margin; the fifth joint is nearly as long as the two preceding together, and, therefore, of very great length; the slender sixth joint was broken; the distal part being broken in each of the last three pairs of peræopods, it can only be stated with the necessary reserve, but still as almost a matter of certainty, that the fifth are longer than the third, and the fourth longer than the fifth.

Concluding Observation on the Gammarina.

In 1876 Dr. v. Willemoes Suhm writes with regard to Tristan da Cunha, that they there found "Gammarus everywhere under stones." It is possible that specimens were not thought worth collecting, but at any rate I have not found in the collection of Amphipoda entrusted to me any shore specimens from Tristan da Cunha.

Tribe II. AMPHIPODA CAPRELLINA.

Head in general with the boundaries marked, but otherwise coalesced with the first segment of the peræon; exceptions rare (*Platycyamus*).

The second to the seventh segments of the *Peræon* as a rule distinct; occasionally two of them coalesced (*Platycyamus thompsoni*, *Protella haswelliana*).[1]

Pleon degraded, consisting of one, two, or (*Cercops*) five small segments.

Eyes two.

Antennæ, two pairs; the upper larger than the lower, without accessory flagellum.

First Maxillæ with the inner plate undeveloped.

Maxillipeds with (Caprellidæ) or without (Cyamidæ) two [2] pairs of plates, and generally with the palp four-jointed; the palp rarely one-jointed (*Platycyamus*).

The side-plates of the peræon never largely developed.

Pleopods wanting; *Uropods* never more than two [3] pairs, and those more or less rudimentary.

In 1813 Leach established the Caprellini as sixteenth family of the Class Crustacea, and fourth family within the tribe Gasteruri, giving for it the following brief definition—"Body six-jointed, all the articulations except the second and third bearing feet. Two oars on each side, placed on the sides of the second and third joint." As he assigned to this family the two genera *Caprella* and *Cyamus*, it is practically equivalent to the Amphipoda Caprellina. In 1814 Leach changed the name Caprellini into Caprellides, which he called the fourth tribe of Gasteruri, including in it the new genus *Proto*. In 1815 and 1816 he took what must be considered a backward step, since in the third section of the legion Edriophthalma he united this group with the Isopoda. He made it the first division of its section, improving the classification by forming two subdivisions, the first for *Proto* and *Caprella*, the second for *Larunda* [*Cyamus*], but erroneously assigning "Pedes 14" as a general character of the division.[4] See Notes on Leach, 1813 (p. 84), 1814 (p. 86), 1815 (p. 90). In 1817 Latreille established the order Læmodipoda to receive this group, which he had previously, under the name Cystibranchia, combined with the Isopods. See Notes on Latreille, 1817 (pp. 95, 99). For further definitions

[1] In *Platycyamus thompsoni* (Gosse) Lütken says that the branchiferous segments, that is, the third and fourth, in the female though not in the male, are coalesced for the greater part of their breadth; in *Protella haswelliana*, Mayer says that the sixth and seventh segments are coalesced.

[2] In *Cercops* Krøyer observed only one pair of plates, but thought that the second pair had by its small size escaped his observation.

[3] The "two very small, oval or vesicular organs" at the base of the first uropods in *Cercops*, which Krøyer figures and describes, cannot, with respect to their form and position, be regarded with any probability as representing either pleopods or uropods.

[4] In the Encyclopædia Britannica, Art. Annulosa, p. 423, he says without qualification, "Division I. Body with all the segments bearing legs." In the *Trans. Linn. Soc. Lond.*, vol. xi., he says of the legs, "*paria tertium et quartum* sæpius spuria," no doubt in allusion not to rudiments of the actual legs but to the branchiæ.

of the Læmodipoda, see Note on Desmarest, 1825 (p. 123); Latreille, 1825 (p. 125), 1829 (p. 138); Burmeister, 1837 (p. 171); Milne-Edwards (Caprellines), 1838 (p. 174); Milne-Edwards, 1840 (p. 184); Krøyer, 1843 (p. 202). In 1828 Zenker included this group in the Leptomeræ, which he made the second family of the Isopods. In 1852 Dana made this group, under the name Caprellidea, the first subtribe of the Amphipoda, with the two families Caprellidæ and Cyamidæ; see Note on Dana, 1852 (p. 256). Spence Bate in 1856, drawing up his system of classification in concert with Westwood, divided the Amphipoda into "Group A. Normalia," and "Group B. Aberrantia," the latter containing the single family Caprellidæ; in 1857 he added to this group the family Dyopedidæ, and in 1862 he retained the group unaltered, except that the name Dyopedidæ was changed into Dulichidæ, and the family Caprellidæ was divided into Caprellidæ and Cyamidæ. This arrangement is also followed by Bate and Westwood in the British Sessile-eyed Crustacea. Boeck in 1870 made the Caprellidæ the fifth family of the Gammaridæ, with two subfamilies, the Caprellinæ and Cyaminæ; in 1872–1876 he made the Amphipoda Caprellina the third division of the Amphipoda, with the two families Caprellidæ and Cyamidæ. Sars in 1882 and 1885 follows this arrangement with the unimportant alteration of calling the Caprellina the third tribe instead of the third division. Mayer in 1882 reverts to the Læmodipoda as the name of one of the three principal groups, whether to be called subtribes or divisions, of the Amphipoda, including in it the two families, the Caprellidæ and Cyamidæ. Carus in 1885 adopts the same terminology, except that he calls the Læmodipoda the first tribe of the Amphipoda. Gerstaecker in 1886 calls the Læmodipoda the second suborder of the Amphipoda; for the definition see Note on Gerstaecker, 1886 (p. 579). Bovallius in 1886 makes the Caprellidea the fifth tribe. An objection may be raised to the name Caprellina, on the ground of its calling attention too exclusively to one only of the families, and that not the one which embraces the oldest genus in the group, namely *Cyamus*, Latreille; on the other hand the term Læmodipoda has been criticised as implying an attachment of the first gnathopods to the head, which is in no case actual, and in *Platycyamus* not even apparent; there is also, I think, an advantage in having the names of the three divisions or tribes of the Amphipoda terminating alike.

Family Caprellidæ, White, 1847.

Mandibles with dentate cutting edge and secondary plate; with or without three-jointed palp.

Maxillipeds with two[1] pairs of plates and the palp four-jointed.

Body narrow, more or less cylindrical; side-plates often present, though rudimentary.

[1] See note on *Maxillipeds* in the character of the tribe.

The Peræon seldom or never[1] carrying seven pairs of fully developed limbs.

Branchial Vesicles on the second, third, and fourth, or only on the third and fourth, segments of the peræon.

Pleon with one, two, or five segments.

Uropods.—Two pairs, one or both being sometimes scarcely appreciable.

The name Caprellidæ for this family appears first, so far as I remember, in White's List of the specimens of Crustacea in the collection of the British Museum, 1847; in 1857 White gave the following definition :—

"Body elongated, cylindrical, and very narrow. Four well-developed antennæ. Legs long and slender. Coxæ fused with the body of the animal. Animals not parasitic."

For Krøyer's definition of his equivalent subdivision, Caprellina, see Note on Krøyer, 1843 (p. 202). For Mayer's definition of the family Caprellidæ, see Note on Mayer, 1882 (p. 535). Mayer describes the genera known to him in the following order, *Cercops, Proto, Caprellina, Protella, Ægina, Æginella, Caprella, Podalirius.* Accepting this order as far as the older genera are concerned, I insert the genus *Dodecas* after *Proto*, change the name *Caprellina* into *Caprellinopsis*, provisionally placing the new genus *Caprellinoides* immediately after it, and following this by the new genus *Protellopsis*, finally allowing the preoccupied name *Ægina* to be absorbed in *Æginella.*

Genus *Proto*, Leach, 1814.

1814. *Proto*, Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 433.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii.
1816. *Proton*, Latreille, Nouveau Dict. d'hist. nat., vol. v.
1816. *Leptomera*, Latreille, Nouveau Dict. d'hist. nat., vol. v.
1817. *Proto*, Latreille, Le Règne animal, t. iii.
1817. *Leptomera*, Latreille, Le Règne animal, t. iii.
1818. „ Lamarck, Hist. nat. des Anim. sans vert., t. v.
1823. *Proto*, Fleming, Edinburgh Philosoph. Journal, vol. viii.
1823. *Leptomera* (*?*), Fleming, Edinburgh Philosoph. Journal, vol. viii.
1825. „ Desmarest, Consid. gén. sur les Crustacés, p. 275.
1825. *Proton*, Desmarest, Consid. gén. sur les Crustacés, p. 276.
1825. *Proto*, Guerin, Encycl. Méth. Hist. Nat., t. x. (under *Proton*).
1825. *Leptomera*, Guerin, Encycl. Méth. Hist. Nat., t. x. (under *Proton*).
1828. „ Zenker, Das thierische Leben und seine Formen, p. 342.
1828. *Proto*, Zenker, Das thierische Leben und seine Formen, p. 342.
1829. *Leptomera*, Latreille, Le Règne animal, t. iv.
1829. *Naupredia*, Latreille, Le Règne animal, t. iv.
1830. *Leptomera*, Desmarest, Bosc's Manuel de l'hist. nat. des crust., t. ii., new edition.

[1] In *Proto* there are seven pairs of limbs, but the third peræopods, though with the full number of joints, by their comparative shortness indicate an arrest of development.

1835. *Proto*, Johnston, The Magazine of Natural History, vol. viii.
1837. *Proton*, Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. ,, Milne-Edwards, Lamarck's Hist. nat. des Anim. sans vert., 2_e Éd., t. v.
1839. ,, Wiegmann, Archiv f. Naturgesch., Jahrg. v. Bd. i. p. 111.
1840. *Naupridia*, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 109.
1840. *Leptomera*, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 109.
1840. ,, Lucas, Hist. Nat. des Crust., &c., p. 223.
1840. *Naupredia*, Lucas, Hist. Nat. des Crust., &c., p. 224.
1843. *Leptomera*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 496.
1843. ,, Rathke, Beiträge zur Fauna Norwegens, p. 97.
1844. *Proto*, W. Thomson, Ann. and Mag. Nat. Hist., vol. xiii. p. 435.
1847. *Leptomera*, Frey and Leuckart, Beiträge zur Kenntniss wirbelloser Thiere, p. 101.
1847. *Proto*, White, List of the specimens of Crustacea, Brit. Mus., p. 92.
1850. ,, White, List of the specimens of Brit. Animals, Brit. Mus., p. 61.
1852. ,, Couch, Trans. Nat. Hist. Penzance, vol. ii.
1852. ,, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv.
1852. ,, Dana, U.S. Explor. Exped., vol. xiii. pt. ii., p. 807.
1855. *Leptomera*, Gosse, Manual of Marine Zoology.
1857. *Proto*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 19.
1857. ,, White, Popular History of British Crustacea, p. 218.
1860. ,, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 670.
1860. *Leptomera*, v. Vollenhoven, Naturlijke Historie van Nederland.
1861. *Naupredia*, P. J. van Beneden, Recherches sur les Crust. du litt. de Belgique.
1862. *Proto*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 349.
1863. ,, Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 36.
1870. ,, Boeck, Crust. amph. bor. et arct., p. 188.
(?) 1875. *Leptomera*, Maitland, Tijdschr. der Nederl. Dierk. Vereen., Erste Deel, p. 245.
1876. *Proto*, Boeck, De Skand. og Arkt. Amph., p. 670.
1876. ,, Stebbing, Ann. and Mag. Nat. Hist., ser. 4, vol. xvii. p. 78.
1878. ,, Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 60.
1879. ,, Haller, Læmod. filiformes, Zeitschr. f. wiss. Zool., Bd. xxxiii. p. 396.
1880. ,, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 275.
1881. ,, Delage, Appareil circulatoire des Crust. Édriophth. marins, p. 132.
1882. ,, Haswell, Catal. Australian Crustacea, p. 310.
1882. ,, Mayer, Die Caprelliden, p. 21.
1884. ,, Blanc, Die Amphipoden der Kieler Bucht, pp. 51, 85.
1885. ,, Carus, Prodromus Faunæ Mediterraneæ, p. 387.
1885. ,, Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract) p. 1.

For the original definition of the genus, see Note on Leach, 1814 (p. 86).

It is thus defined by Mayer, though not verbally as follows, yet to this effect :—

"The *Peræon* with seven pairs of completely developed legs.

"The *Mandibles* with a palp.

"*Branchial Vesicles* on the second, third, and fourth segments of the peræon.

"*Pleon* one-jointed, having in both sexes two pairs of two-jointed *Uropods* (Fuss-stummel).

"*Lower Antennæ* without motor-setæ (Ruderhaare), the flagellum in the adult animal consisting of more than two joints."

The *Third Peræopods* may on the one hand be regarded as completely developed, inasmuch as they have the full number of joints, but, on the other hand, compared with the elongate limbs which precede and follow them, they have a dwindled appearance that might well be attributed to incomplete development.

Proto novæ-hollandiæ, Haswell, 1880.

1880.	*Proto Novæ-Hollandiæ*,	Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 275, pl. xii. fig. 3.
1882.	„ „	Haswell, Catal. Australian Crust., p. 310.
1882.	„ „	Mayer, Die Caprelliden, p. 26.
1885.	„ „	Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extr. p. 5).

Head and body without spines ; the very short first segment of the peræon intimately coalesced with the head, the following segments sucessively longer to the fifth, the sixth as long as the fourth, shorter than the fifth, the seventh very short ; the second segment dilated at about the middle in the male, but more proximally in the female, in each case at the point of attachment for the second gnathopods.

Eyes rather large, dark in specimens preserved in spirits, not regularly rounded, the ocelli numerous, as many as a hundred and fifty to each eye.

Upper Antennæ.—First joint not as long as the head with the first segment ; the second joint much thinner than the first, not twice as long ; the third joint intermediate in length between the first and second ; the flagellum of seven slender joints, carrying short cylindrical filaments, these joints together not as long as the peduncle ; the second and third joints of the peduncle and the joints of the flagellum with the margins minutely tuberculate in the male, but not, or almost imperceptibly, in the female, in which the flagellum is of six joints.

Lower Antennæ much slighter than the upper, the peduncles of which they equal in length ; first and second joints very short ; third a little longer than the preceding two together ; fourth a little shorter than the fifth ; fifth about equal in length to the third joint of the upper antennæ ; flagellum of three very slender joints, together not equal to the fifth joint of the peduncle in the male, but equal to it in the female, in which this joint is not longer than the fourth.

Mandibles.—The cutting edge with five unequal teeth on one mandible and six on the other, of which one is more prominent than the rest ; the secondary plate with four teeth on one mandible, probably on both ; there are also some laminar spines, not seen with sufficient distinctness for particular description ; the second joint of the palp with the spines few and scattered, the third with two at the apex and several at a little distance from the apex on and near the oblique ciliated apical or inner margin.

First Maxillæ.—The outer plate with six slender spines on the distal margin, only weakly denticulate ; the palp with the apical margin not expanded, carrying four

little teeth or spines, and a spinule or two on a little indent near the top of the inner margin.

Maxillipeds.—Inner plates small, not reaching the apex of the first joint of the palp, not strongly armed; the outer plates small, reaching little beyond the inner, about level with the apex of the first joint of the palp, the distal part of the inner margin serrate, armed with a few spinules; the first joint of the palp scarcely longer than its distal breadth; the second joint about twice the length of the first, broad, with slender spines on the inner margin; the third joint not much shorter than the second; the finger as long as the third joint.

First Gnathopods.—First joint as long as the hand, but narrower, widening a little distally; third joint a little longer than the second, with half-a-dozen slender geniculate spines across the inner surface, the middle of the convex hind margin furred, the front apex acute, resting on the wrist; the wrist much longer than the third joint, shorter and much narrower than the hand, the front margin smooth, the hinder furred, the inner surface carrying many slender spines; the hand widening from the base to the apex of the short hind margin, which is partly furred, the adjoining surface being microscopically marked with lines of pectination, the apex itself forming a strong denticulate tooth-process carrying setules and a palmar spine; from the cavity of this process rises on the inner surface a much smaller triangular process, also carrying a palmar spine; from this point to the narrowed apex of the hand the long convex palm, which almost usurps the place of the hind margin, is planted with numerous small spines and a few setules; the front margin is smooth, not very convex, with four transverse rows of long graduated spines on the adjoining surface; the finger is as long as the palm, slender, curved, with a very small dorsal cilium close to the base, and some cilia or hairs near the smooth inner margin.

The Second Gnathopods much larger than the first, especially in the male, in which the hand is immensely dilated; in structure the second gnathopods much resemble the first, except in regard to the wrist, which is here scarcely longer than the third joint, almost coalescent with the hand, to which it forms a very narrow base; the finger is bulky in some proportion to the size of the hand, having in the Challenger specimen of the male a small incurving of the inner margin near the base. The male specimen was defective beyond the second segment of the peræon.

First Peræopods.—Side-plates small, but very distinct, much broader than deep. Branchial vesicles small, a narrow oval. Marsupial plates large, the fringing setæ small. The limb very slender, first joint nearly as long as the segment; second slightly narrower than the first, little longer than broad; third longer than the fourth, the two together about as long as the first; the fifth a little longer than the fourth, scarcely narrower; the finger slender, tapering, curved at the acute tip, nearly as long as the fourth joint.

Second Peræopods as nearly as possible like the first peræopods, both pairs being without armature, except a few microscopic hairs or cilia.

Third Peræopods missing; the muscles running to this pair and the place of articulation are rather behind the centre of the segment.

Fourth and *Fifth Peræopods* missing, articulated at the extremities of their respective segments.

Length of female, without the antennæ and hind limbs, a fifth of a inch; length of the second gnathopod of the male, with the finger open, more than a tenth of an inch.

Locality.—Port Jackson, Australia; depth, 2 to 10 fathoms. Three defective specimens, an adult male, a female with the marsupial plates fully developed, and another female of the same size with the marsupial plates quite small.

Remarks.—It seems in the highest degree probable that this is the species described by Mr. Haswell as *Proto novæ-hollandiæ*, but his account of the first and second peræopods does not agree, being as follows:—"First pair of pereiopoda slender, as long as the second and third segments of the pereion, with a slight tooth on the posterior margin of the propodos. Second pair much larger than the first or third, rather longer than the cephalon and the first two segments of the pereion, the carpus, propodos, and dactylos short, the propodos armed with four spines and a row of serrations on its anterior border." These observations may be true of the male, and yet not apply to the female, but it seems unlikely that the second peræopods should differ so much from the first, since in the other known species of the genus these two pairs, so far as they have been described, are in close agreement.

Genus *Dodecas*, Stebbing, 1883.

1883. *Dodecas*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 207.

Mandibles with an elongate three-jointed palp.

Lower Antennæ with a flagellum of more than two joints.

The *First* and *Second Gnathopods* and *Fourth* and *Fifth Peræopods* fully developed; the *First* and *Third Peræopods* feebly developed, the *Third* not having the full number of joints; the *Second Peræopods* wanting.

Branchial Vesicles on the second, third, and fourth segments of the peræon.

Pleon undivided.

Uropods two-jointed.

The generic name is derived from the Greek δωδεκάς, a set of twelve, this genus being distinguished from the rest of the Caprellidæ by having twelve limbs (in six pairs) attached to the peræon.

With regard to the three systems of arrangement proposed by Mayer in his "Caprelliden," pp. 18, 19 (1882), *Dodecas* in the first will stand after *Proto* and *Protella*, in the other two between *Proto* and *Caprellina*.

Dodecas elongata, Stebbing, 1883 (Pls. CXXXIX., CXL.).

1883. *Dodecas elongata*, Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. xi. p. 207.

Body smooth, sometimes more or less speckled, very long and slender; the first and second segments of the peræon very long and slender in the male, much shorter and rather thicker in the female, in both sexes the first broadest at its junction with the almost completely coalesced head, and narrowest at its junction with the second segment, which is broadest at the part where the limbs are attached; the third and fourth segments are shorter in the male, and much shorter in the female, than the fifth and sixth; in the female the third is widened distally, the fourth proximally; in both sexes the seventh segment is very short.

Eyes prominent, round or a little oval, situate near the top and front of the head, small, but with the ocelli very numerous.

Upper Antennæ large and long, the first joint of the peduncle stout, about as long as the head, the second joint more slender, from two and a half to three times as long, the third more slender and a little shorter than the second; the flagellum showing in different specimens seven, eight, or nine joints, of which the first is much the longest, with setules at three or four points of the lower margin, the remainder having each an apical setule, all except the last being a little dilated distally, the whole flagellum much shorter than the fifth joint of the peduncle.

Lower Antennæ very slight in comparison with the upper, the flagella of which they do not greatly exceed in length, nor in thickness at all, except at the base, the first and second joints appearing to be completely coalesced, the gland-cone minute, the third joint a little longer and more slender than the preceding two, the fourth joint nearly twice as long as the three preceding together, the fifth nearly as long as the third and fourth together; the flagellum of three, four, or five very slender joints, together not so long as the last joint of the peduncle.

Upper Lip distally rather deeply divided into two unequal lobes, the margin smooth.

Mandibles.—Cutting plate divided into five strong unequal teeth, of which the lowest is bifid, the others sometimes assuming the same appearance from wear; in one specimen the right mandible had but four teeth, not showing any signs of loss or breakage, while the new growth displayed the usual five; the secondary plate on the left mandible nearly as large as the primary, its broad distal edge divided into five or six teeth; on the right mandible this plate is less powerful, its distal edge broad and

nearly straight, with a small tooth at the top, which is evidently liable to be worn down, the remainder of the edge perhaps finely serrate; on each mandible there are two plates similar in form to the secondary plate of the right mandible, but successively smaller; these are followed by a group of backward curving spines, nine or more in number on the left, perhaps less numerous on the right, mandible; there does not appear to be any dentate molar tubercle; the first joint of the palp is about half the length of the second; the second, which has seven or eight slender spines distributed over it, is very little longer than the third joint; of this the front margin is clear for nearly the first half, the remainder carrying a series of from ten to thirteen spines, one at either end being more than twice as long as the rest; the apex of the joint is acute. The figure which Hoek[1] gives of the mandible of "*Leptomera pedata*," in many respects resembles the mandibles just described, and a similar arrangement is observable in *Caprellina longicollis*, Nicolet, judging from a specimen sent me from New Zealand by Mr. G. M. Thomson.

Lower Lip.—The principal lobes pretty widely dehiscent, their rounded distal margins finely ciliated; the inner lobes large and prominent, distally rounded; the mandibular processes apically narrowed.

First Maxillæ.—Inner plate wanting or at most rudimentary; outer plate carrying six spines on the truncate distal margin, the innermost and three following pectinately feathered, but not strongly, the two outermost having each a strong lateral tooth on the inner side and a very slight pectination of the margin near it; the first joint of the palp not longer than broad, the second long, with several pectinate spines on the denticulate apex, and setæ or setiform spines along much of the inner margin.

Second Maxillæ.—The inner plate short, but a little broader than the outer, with about fourteen slender spines round the apical margin, the series slightly descending the inner margin; the outer plate similarly armed, but with the margin less convex and the spines very unequal in size, none on either plate being strongly feathered or pectinate.

Maxillipeds.—The inner plates not reaching the apex of the first joint of the palp, having four setiform spines crossing the distal end of the outer surface, the apical border concave, with two little teeth at its outer corner, a small spine-tooth inserted below the inner corner, the margin itself near to this corner bearing an arrangement of three large, closely-set spine-teeth, two with their serrate edges facing one another, the third and largest intermediate, overlapping and out-topping the other two, with its serrate edge facing outwards; the distal part of the very convex outer margin is a little serrate; the basal part of the joint carrying these plates rises on the outer surface to a divided apex, each half carrying five setæ in two sets; the outer plates are smaller than the inner, and reach just to the apex of the first joint of the palp, the inner margin serrate, armed with setiform spines, the outer margin convex, smooth except for some microscopic

[1] Carcinologisches, Taf. viii. figs. 1, 1*a*, 1879.

serration apically; the first joint of the palp is not much longer than broad, with two or three setæ near the apex of the almost straight inner margin; the second joint nearly twice as long as the first, the inner margin fringed with setæ, of which there are also groups on the inner surface, the third joint widening from the base, the apical margin oblique on the inner side and fringed with setæ, on the outer side carrying a setule, and with its rounded edge overlapping the base of the fourth joint; the fourth joint longer than the third, curved, pointed, a little ciliated, and having a small dorsal cilium very near the base.

Triturating Organs.—These are small, not regularly oval, apparently without any armature except a row of seven or eight rather broad, slightly pectinate spines, along a margin which slightly projects.

First Gnathopods attached just where the segment coalesces with the head, close to the base of the maxillipeds; the first joint narrow at the base, widening distally, not greatly longer than the hand in the male; the second joint rather longer than wide; the third not much longer than the second, somewhat rhomboidal, with a group of spines at the slightly furred hinder apex, and others on the surface; the wrist narrow at the base, then widening, shorter than the hand, with numerous setiform spines on the surface and along the hind margin; the hand abruptly wider than the wrist, tending to oval, narrowest distally, with several groups of spines on the surface near the front margin, the hind margin, as distinct from the palm, short, ciliated; the palm-border long, convex, fringed on both sides with short spines and setules, the cavity at its junction with the hind margin of the hand being set round with five unequal palmar spines, larger than those along the border; the finger large, curved, matching the palm, with some small cilia on the inner margin, and a very small dorsal cilium near the hinge. The hand in the female is rather smaller than in the male.

Second Gnathopods.—Attached, in the male, close to the hinder end of the segment, which is here abruptly dilated, and bulbous in the lateral view; in the female the attachment is near to the front end of the segment, which from this point of considerable dilatation narrows backwards; the first joint narrow, widening a little distally, of great length in the male, more than twice as long as in the female, being nearly three and a half times as long as the branchial vesicle in one sex to once and a half in the other; the second joint short; the third in the male about twice as long as the second, but scarcely so much in the female; narrow at each end; the wrist narrow, of very great length in the male, sometimes even longer than the first joint, though sometimes shorter, in the female shorter even than the third joint, almost triangular; the hand oval, long and stout, the base in the male a little narrowed, the front margin almost unarmed, as likewise the much shorter hind margin; the long convex palm beginning with an emargination, of which the tips are serrate, and on either side of which large palmar spines are planted; beyond this the border is fringed

on both sides with numerous short spines and occasional setules, and apically forms a small tooth or projection, between which and the hinge of the finger it is crenulate, the fringe of spines not being interrupted; the finger is large, curved, acute, matching the palm.

First Peræopods.—Attached a little behind the centre of the segment, which is here a little dilated in the male, and greatly in the female. Branchial vesicles narrow and elongate, about two-thirds the length of the limb. Marsupial plates much longer and enormously broader than the branchial vesicles, in some specimens adorned with numerous dendritic colour-spots. The limb extremely slender, and smooth; the first joint longer than the third and fourth together; the second longer than broad; the third a little shorter than the fourth and fifth together; the fourth and fifth subequal; each of the five joints having a setule at or near the apex of the hind margin; the finger more than half the length of the fifth joint, with convex front margin, broad at the centre, the tip acute, near which the hind margin has a row of about six small spines, the bases of which are broad. The relative proportions of the joints vary to some extent with age and sex.

Second Peræopods wanting. The branchial vesicles are attached at the centre of the segment, which in the male is here very slightly dilated, while in the female as usual the anterior part of the segment is broad, the posterior narrow; the branchial vesicles scarcely so large as the preceding pair.

Third Peræopods.—Attached behind the centre of the segment, small and degraded, with only four distinct joints; from the shape of the first of these it may be supposed that it represents the second and third coalesced; it about equals the length of the next, or fourth joint; the following or fifth joint is about equal to the two preceding united, and is rather stouter, somewhat curved; the finger is half the length of the preceding joint, strongly curved, acute.

Fourth Peræopods.—Attached at the distal end of the segment, which is here dilated; the first joint elongate, like all the others except the second, distally a little widened, rather longer than the fifth joint; the second joint scarcely longer than broad; the third joint rather shorter than the fourth, widened a little distally; the fourth subequal to the fifth, having a spine near the base on the front margin; the fifth joint having a pair of spines near the base and several single spines along the course of the front margin and some setules on the hind margin, the spines simple except for the accessory thread on the outer side; the finger curved, acute, as long as the fifth joint.

Fifth Peræopods.—Attached at the distal end of the short seventh segment, similar in general to the preceding pair, but the first joint much shorter, the fourth, fifth, and finger considerably longer than in that pair. In the relative proportions of these joints there is some amount of variation, whether it be from individual difference or due to age or sex.

Uropods.—Of these small appendages the first pair are the longer; in each case the first joint is much longer than the second, and its fringe of spinules on the concave side much stronger.

Length.—The longest specimen is figured at the top of Pl. CXXXIX., to the right. From head to pleon, in the position figured, this measures an inch and a half; the upper antennæ in front are more than an inch long, and the hinder peræopods are capable of extension to the length of half an inch, giving a total extensibility of at least three inches; the second gnathopods in this specimen are an inch in length; more than any other Crustacean, with the exception perhaps of *Rhabdonectes*, this animal suggests the geometrician's definition of a line, as length without breadth. The females, which do not appear to attain so great a length as the males, are as usual broader in the marsupial region.

Localities.—Station 149F, Rhodes Bay, Kerguelen Island, January 27, 1874; depth, 95 fathoms; bottom, volcanic mud. A male and three females (mounted in Canada balsam); also a great entangled mass of specimens of both sexes.

Station 149G, off London River, Kerguelen Island, January 29, 1874; depth, 110 fathoms; bottom, volcanic mud. One specimen, female, and two mounted specimens.

Kerguelen; 100 fathoms; two mounted specimens, female (Stations 149G or 149J).

Genus *Caprellinoides*, n. gen.

Mandibles with a three-jointed palp.

Lower Antennæ with a flagellum of (probably) more than two joints.

The *Third Peræopods* with only three distinct joints, of which the last is not unguiform; the *First* and *Second Peræopods* wanting.

Branchial Vesicles only on the third and fourth segments of the *Peræon.*

Pleon one-jointed.

The generic name alludes to the likeness between this genus and *Caprellina*, G. M. Thomson. The name *Caprellina*, having been earlier applied to the whole group, cannot, I think, be used for a genus within the group, and I have therefore proposed in the Note on Nicolet, 1849 (p. 233), to change it into *Caprellinopsis*, being under the impression at the time that Note was written that the species for which a new genus is now instituted would fall under Mr. Thomson's *Caprellina*. *Caprellinopsis*, however, differs from *Caprellinoides*, in that the mandibles have, besides several slender spines, two broad laminar spines like those in *Dodecas elongata*, and that it has three pairs of branchial vesicles, and the degraded third peræopods ending in a strong claw.

In Mayer's first system *Caprellinoides* will stand between *Caprellinopsis* (= *Caprellina*, Thomson) and *Podalirius*, in his second perhaps between *Proto* and *Caprellinopsis*,

and in his third along with *Ægina* and *Æginella*. In the arrangement which Mayer adopts for his own work *Caprellinoides* might provisionally follow *Caprellinopsis*, but the doubtfulness of the lower antennæ and the uropods prevents any certain decision.

Caprellinoides tristanensis, n. sp. (Pl. CXLI.).

Body smooth, slender; the rather skull-like head with the closely coalesced first segment of the peræon together shorter than the second segment of the peræon; this much shorter than the third, the third shorter than the fourth, the fourth about half the length of the narrow and elongate fifth, the sixth not quite so long as the third, the seventh not longer than broad; the second segment is dilated anteriorly and narrow distally, the third and fourth, as usual in the female (which sex alone was available for investigation), much dilated, the third narrow for a very short space in front, the fourth abruptly narrowed and tapering for the distal third of its length. The pleon has the appearance, viewed laterally, of consisting of two very small joints, the second much smaller than the first, but such an appearance is explained by Mayer [1] to be due to the valve at the opening of the intestinal canal.

Eyes not clearly made out.

Upper Antennæ.—First joint stouter than the second, but not so long; second joint twice as long as the third; the third a little widened distally; the flagellum longer than the peduncle, of four elongate joints, the first as long as the second joint of the peduncle, with two cylindrical filaments, each of the other joints with one such filament; there are a few setules or cilia on the peduncle as well as on the flagellum.

Lower Antennæ not much longer than the peduncle of the upper, the first two joints very short, the gland-cone small, decurrent; the third joint about as long as the coalesced first and second; the fourth joint longer than the three preceding united; the fifth joint rather longer than the fourth; of the flagellum only two joints remaining, the second considerably longer than the first, the appearance of its distal end indicating that a third joint had probably been broken off.

Upper Lip apically cleft.

Mandibles.—The cutting plate divided into five teeth; the secondary plate, at least on one of the mandibles, nearly as broad as the primary, and likewise divided into five teeth; on this mandible a small prominence was visible, looking like a short double-headed spine; the first joint of the palp short, the second scarcely so long as the third, with a setule near the middle of the inner margin, the third joint with five slender spines on the oblique apical margin. *Caprellinopsis longicollis* (Nicolet) from New Zealand has a somewhat similar palp, but with the second joint rather longer than the third, carrying five setiform spines, the third joint having four unequal spines on

[1] Caprelliden, p. 95.

the apical margin, and at the actual apex a short stout spine pectinate on two edges and with a slender curved tip.

First Maxillæ.—Inner plate absent or rudimentary; outer plate not broad, apically carrying five or (perhaps) six small spines; the first joint of the palp more than half the length of the second, the second having a few spinules or setules on the more or less denticulate apical margin.

Second Maxillæ.—The inner plate very small, with two small setæ or slender spines on the rounded apex; the outer plate apically rather narrower than the inner, with three or four spines or setæ, the outer margin bowed out below.

Maxillipeds.—The inner plates very small, not reaching even to the base of the palp, having a setule on the inner margin and two on the rounded apex; the outer plates narrow, reaching about to the centre of the second joint of the palp, with four spinules along the inner and apical margin; first joint of the palp the shortest, the second not twice as long, with a small spine on the inner margin near its apex, the third joint about equal in length to the second, with three spinules near the inner apex and a setule near the outer, the finger as long as either of the preceding joints, with a cilium near the acute curved tip.

First Gnathopods attached close to the maxillipeds. The first joint little longer than the hand, a little widened distally; the second joint rather longer than broad, the third joint longer than the second, as long as the wrist, narrow at the neck, the hind margin longer than the front, nearly straight, the broad apex having two setules, the surface one; the wrist small, four-sided, carrying a couple of setules, the front margin the longest, convex; the hand much larger than the wrist and abruptly wider, between oval and triangular in shape, narrowing to the distal end, the front margin convex, with some apical setules, and a row of setiform spines on the surface near its distal half; the short hind margin almost at right angles to the front margin, while its place is practically taken by the long, nearly straight, palmar margin, which has a row of four spinules and another of four setules adjacent to it, the edge itself being microscopically ciliated or pectinate; the long, curved, acute finger matches the palm, its tip closing down between two small palmar spines, its inner edge strongly pectinate.

Second Gnathopods attached close to the proximal end of the segment. The first joint similar in shape to that in the preceding pair; the second joint longer than broad, longer than the third joint; the third joint very short, front and hind margins almost equal, narrow at the neck, the distal margin flat; the wrist very small, triangular, shorter than the third joint, with only the front margin free; the hand similar in structure to that of the first gnathopods, but less narrowed apically, the palm margin entirely taking the place of the hind margin, from which it is marked off by a small projection with a strong palmar spine planted on it; the palm margin, besides having some spinules and setules at intervals along it, is finely but irregularly denticulate,

with two small teeth breaking the line of denticles in the distal half; the long and powerful finger has a sharp tip, which closes down between and beyond the large palmar spine and a smaller one on the surface; its inner edge is smooth.

First Peræopods wanting, or only represented by the small joint, at the extremity of which the branchial vesicles are attached. Branchial vesicles small and almost round, a little narrowed at the point of attachment. Marsupial plates enormously larger than the branchial vesicles, oval, the distal end the larger, the rim crenulate, fringed with setæ.

Second Peræopods in the same condition as the first. The branchial vesicles and marsupial plates nearly as in the preceding segment, but in this the marsupial plates are directed forwards instead of backwards; they are, like the others, fringed with setæ.

Third Peræopods three-jointed, attached above the centre and at the broadest point of the very narrow elongate segment; the first joint attached to the distal border of a small laminar projection which may be regarded as representing a side-plate, the joint not twice as long as broad, distally widened; the following joint more than twice as long, armed with two or three setules; the third joint as long as the first, slightly tapering, with a setule at the apex, and one on either side a little way above it. There is little or nothing to indicate what joints are homologically represented by these three; it may be supposed that the last represents the hand or fifth joint, and that the penultimate represents the fourth, or the third and fourth combined.

Fourth and Fifth Peræopods.—Of these nothing was left but the stumps, but the muscles running to them indicated that they are probably of the average size and strength in proportion to the size of the animal.

Uropods.—There was nothing about the pleon to indicate whether the uropods were naturally or accidentally wanting.

Length.—The specimen, in the position figured, measured without the antennæ one-seventh of an inch. Fully extended it would have been rather more.

Locality.—Station 135c, off Nightingale Island, Tristan da Cunha, October 17, 1873; depth, 110 fathoms. One specimen, female.

Remark.—The specific name refers to the place of capture.

Genus *Protellopsis*, n. gen.

The *First* and *Second Peræopods* rudimentary, consisting of two joints.

Uropods of the first pair reaching beyond the pleon, two-jointed, the second joint comparatively long and narrow; the second pair short, tapering.

In other respects this genus is like *Protella*, Dana.

In Mayer's arrangement of the Caprellidæ this genus will stand immediately in front of *Protella*.

Protellopsis kergueleni, n. sp. (Pl. CXLII.).

The Head smoothly rounded above; the first segment of the peræon longer than the head, with a single dorsal upright tooth at the distal end; the second (first free) segment with two dorsal spines inclining forwards at about the centre, and a single larger and more upright one at the distal end; the hinder part with its lower margin overlapping the base of the next segment; the third segment rather longer than the second, having at the distal end a tooth broader than high; the fourth segment a little shorter than the third; the fifth longer than either, and longer than the sixth and seventh together, having a projecting tooth on either side near the base, widening to the attachment of the limbs, then abruptly narrowing; the sixth segment much longer than the seventh, distally widened. There are no ventral spines. The animal is sometimes speckled with dendritic markings on almost all parts.

Eyes round, retaining colour in the specimen mounted in Canada balsam.

Upper Antennæ.—The first joint rather shorter than the head and its accompanying segment, with a pair of spinules above the centre of the upper margin, and three or four on its distal end; the second joint thinner and longer; the third about half the length of the first, widening a little distally; the flagellum longer than the peduncle, of thirty distinct joints, the first as long as the following three together; the joints tipped with small setules, the distal joints long and thin compared with the proximal, excepting the first.

Lower Antennæ thinner and little longer than the peduncle of the upper, the first two joints short, the gland-cone of the second tolerably acute and prominent; the third joint as long as the two preceding united, with a few spinules near the distal end; the fourth joint subequal in length to the first of the upper antennæ, and the fifth a little shorter than their second; the two-jointed flagellum is little more than a third as long as the fifth joint of the peduncle, its first joint having spinules at four points of each margin, the longer ones below; the second joint is tapering, a third the length of the first, with two little curved spines and some setules at its apex.

Mandibles.—The cutting plate divided into five large unequal teeth; the secondary plate on the left mandible with a general similarity to the principal plate, against which it lies so closely that the teeth of the two plates could not be distinguished; the secondary plate on the right mandible apart from the principal plate, much smaller, with its distal edge cut into numerous denticles; the spine-row on the left mandible consisting of three large pectinate spines, the first the more tapering, the other two the more curved; the number of spines in the spine-row on the right mandible was not clearly ascertained; the molar tubercle prominent, with circular strongly denticulate crown; the palp longer than the trunk of the mandible, the first joint considerably longer than broad, the second joint not longer than the third, slightly

curved and widening a little distally, carrying three slender unequal spines; the third joint distally tapering, on the inner margin of this part carrying a row of about eighteen short spines, and at the apex a long pectinate spine, with a short stout one beside it on the outer side; it also carries three spines on the outer surface at the other end of the row, two that are long and pectinate, and a shorter one.

Lower Lip.—The principal lobes wide apart, not very broad nor strongly ciliated; the inner lobes rather broad, occupying much of the vacant space between the principal lobes; the mandibular processes small and narrow.

First Maxillæ.—The inner plate seems to be entirely wanting; the outer plate has seven spines on the apex, of which the innermost are more or less minutely denticulate, the outer three appear to be almost smooth; the first joint of the palp is a little longer than broad, its outer margin longer than the inner; the long second joint much overtops the adjacent plate, and on a strongly dentate apex carries four spine-teeth, and has a couple of setiform spines on the surface below these.

Second Maxillæ.—The inner plate broader and shorter than the outer, with some eight or nine setiform spines on the oblique apical border; the outer plate with the like number round its apical border, the chief part of which slopes outwards, while that of the inner plate slopes entirely inwards; the spines on these plates are scarcely plumose.

Maxillipeds.—The inner prismatic plates very small, scarcely reaching beyond the base of the first joint of the palp; the apex of the inner margin projects a little, the apical border carrying a little imbedded spine-tooth and two curved setiform spines, two larger setiform spines being on the inner surface not far from the apex; the outer plates are a little longer and reach a little beyond the first joint of the palp, with the inner margin straight, the outer convex, the armature consisting of a row of four or five spines spaced along the outer surface, and two marginal spines in notches, one on either side of the apex; the first joint of the palp short, with two slender spines on the inner margin; the second joint the longest, with several spines on and near the inner margin, the third joint rather longer than the first, with numerous spines about the slightly widened apex; the fourth joint as long as the third, curved, the inner margin pectinate, the dorsal cilium close to the hinge.

First Gnathopods attached close to the maxillipeds; the first joint much longer than the hand, narrow at the point of attachment, the front margin straight; the second joint a little longer than wide; the third rhomboidal, with a narrow neck, having a group of spines on the surface near the front and another at the lower angle behind; the wrist longer than the third joint, as long as the hand, widening distally from a narrow base, set with numerous spines on the surface and round the hinder and apical margins; the hand irregularly oval, the surface set with numerous groups of spines; the hind margin much shorter than the front, the difference being made up

by the oblique palm, which is bordered with setules, having at the commencement two stout palmar spines, between which the long curved finger closes down. Most of the spines on this limb are strongly pectinate.

Second Gnathopods attached rather above the middle of the segment. The rudimentary side-plates very inconspicuous; the first joint long and narrow, rather longer than the hand, distally a little widened, at the extremity having the front margin rounded on the outer side, while on the inner side the front margin is produced into a sharp tooth; the second joint scarcely longer than broad; the third joint lageniform, three times as long as the second; the wrist a narrow triangle, little more than half as long as the third joint; the hand large and long, more than twice as long as the greatest breadth, which is at the produced setiferous tooth, with which the oblique hinder margin ends, and the long, somewhat convex palm begins; the palm margin is fringed with spinules and setules and forms another (not outstanding) tooth, not far from the hinge of the finger; the slightly convex front margin forms a very small produced tooth at its apex; the finger is long to match the palm, and, except at its apex, broad; the outer margin has some distant hairs, the inner is faintly crenulate, with the appearance of small canals running from the new growth to the raised points of the existing margin.

First Peræopods attached rather behind the middle of the segment. The branchial vesicles oval, large and long, attached by a short, narrow neck, which has almost the appearance of a joint. The limb very much smaller than the branchial vesicles, not a third of the breadth, and little over a third of the length. The first joint, attached to a small hinge-piece, is shorter than the second and widens distally; the second joint is narrowed at the apex, where it carries a few small hairs.

Second Peræopods similar to the first.

Third Peræopods attached on the ventral surface a little above the distal extremity of the segment. The first joint the longest, distally a little widened, with small groups of spines at three points of the front margin; the second joint scarcely longer than broad, with an apical group of spinules in front; the third joint longer than the fourth, widening to the distal end, with spinules along the front and at the apex behind; the fourth joint similarly armed, less narrow at the base; the fifth joint longer than the third, with a strong tooth projecting from the front margin close to the base and armed with small spines, the rest of the front border fringed with very small spinules; the convex hind margin has setules at three points; the powerful finger, broad except at the curved apex, is of a length to reach the projecting tooth of the front margin.

Fourth Peræopods attached on either side of the widened distal end of the segment, not materially differing from the preceding pair, but a little stronger.

Fifth Peræopods attached on either side of the distal end of the segment, similar

to the preceding pair, but rather stronger, the fifth joint longer; the little prominence on the front margin near the base of the fourth joint is rather more marked in the fourth and fifth than in the third peræopods.

Uropods.—The longer first pair are two-jointed, the first joint short, with a group of slender spines standing stiffly out from the outer distal angle, and a short spine at the inner distal angle; the second joint long, slender, somewhat curved, pectinate with small teeth at right angles to the concave inner margin, the convex outer margin having some spinules near the centre; the corner of the pleon just above the uropods has a group of slender spines; the much shorter second uropods are perhaps one-jointed; the terminal joint, whether solitary or not, is tapering, a little curved, smooth.

Length.—In the position figured, the specimen measured from head to pleon two-fifths of an inch.

Locality.—Station 149E, off Greenland Harbour, Kerguelen Island, January 21, 1874; depth, 30 fathoms; bottom, volcanic mud. Two specimens, males (one mounted in Canada balsam).

Genus *Protella*, Dana.

1852. *Protella*, Dana, Classification Crust. Choristopoda.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 807, 811.
1856. *Ægina*, Spence Bate, Report of the British Assoc. for 1855, pp. 52, 61.
1857. *Protella*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser 2, vol. xix. p. 20.
1860. *Ægina* (*pars*), Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 670.
1862. *Protella*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 351.
1863. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 44.
1863. *Caprella*, Grube, Naturhist. Section der Schlesischen Gesellschaft (*teste* Mayer).[1]
1866. *Caprella* (*pars*), Heller, Amph. des adriatischen Meeres, p. 53.
1868. *Protella*, Czerniavski, Materialia ad Zoographiam Ponticam comparatam, p. 90.
1870. *Ægina* (*pars*), Boeck, Crust. amph. bor. et arct., p. 190.
1876. „ „ Boeck, Die Skand. og Arkt. Amph., p. 676.
1878. *Protella*, Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 61.
1879. „ Haller, Vorläufige Notizen Mittelmeer. vork. Caprelliden.
1879. „ Haller, Læmodipodes filiformes, Zeitschr. f. wiss. Zool., Bd. xxxiii. p. 400.
1880. „ Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 346.
1880. *Caprella* (*pars*), Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 346.
1880. *Protella*, Kossmann, Zool. Ergebnisse, p. 126.
1881. „ Delage, Appareil circulatoire des Crust. édriophth. marins, p. 132.
1882. „ Haswell, Catal. Australian Crustacea, p. 311.
1882. *Caprella* (*pars*), Haswell, Catal. Australian Crustacea, p. 312.
1882. *Protella*, Mayer, Die Caprelliden, p. 28.

[1] Mayer, Caprelliden, p. 196, gives the reference as follows:—"Grube, A. E., Ueber die höhere Crustaceenfauna des Mittelmeeres, Naturhist. Section der Schlesischen Gesellschaft. Sitzung am 1. April 1863. (Mir nur aus einem unpaginirten Sonderabdrucke bekannt geworden)." He refers to it for the species *Caprella quadrispinis*, Grube, which is in Mayer's opinion a synonym of *Protella phasma*, Montagu. I have not seen this paper of Grube's either paged or unpaged.

1885. *Protella*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 387.
1884–5. „ Chilton, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract), p. 8.
1885. „ Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract), p. 5.
1886. „ Fowler, Fauna of Liverpool Bay, Report 1, p. 217.

For the original definition of the genus, see Notes on Dana, 1852 (pp. 256, 265). It may now be defined as follows :—

Mandibles with a three-jointed palp.

Lower Antennæ with a two-jointed flagellum ; devoid of motor-setæ (Ruderhaare).

The two pairs of *Gnathopods* and three hinder pairs of *Peræopods* well developed ; the *First* and *Second Peræopods* rudimentary, consisting of a single joint.

Branchial Vesicles only on the third and fourth segments of the peræon.

Pleon two-jointed.

Uropods rudimentary, neither pair produced beyond the end of the pleon.

The definition given by Mayer has been a little enlarged with a view to the new genus *Protellopsis*. Haswell, in describing *Protella australis* in 1885, says that the flagellum of the lower antennæ "is composed of six articuli," without noting that this is contrary to Mayer's definition of the genus, which he apparently accepts.

Protella gracilis, Dana.

1852. *Protella gracilis*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 812, pl. liv. fig. 2, *a–f*.
1862. „ „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 352, pl. lv. fig. 5.
1880. „ *australis* (*?*), Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 276, pl. xii. fig. 4.
1882. „ „ Haswell, Catal. Australian Crustacea, p. 311.
1882. „ *gracilis*, Mayer, Die Caprelliden, p. 31.
1885. „ *australis* (*?*), Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. p. 5 (separate copy), pl. xlix. figs. 2–4.

A female specimen ; the head and body smooth ; the convex dorsal line of the head longer than the dorsal, equal to the ventral, line of the coalesced first segment of the peræon ; the second segment of the peræon about equal in length to the third, the third a little longer than the fourth, the fifth longer than any of the three preceding, considerably longer than the next two united, the sixth dorsally little if at all longer than the seventh ; the pleon extremely short and small.

Eyes round, not very large, but with from eighty to a hundred ocelli in each.

Upper Antennæ.—The first joint longer than the head ; the second joint more than twice as long as the first, smooth-edged ; the third about as long as the second, narrower, slightly notched for setules ; the flagellum slender, not so long as the third joint of the peduncle, of about twenty-one joints, each carrying an apical filament (the last joint perhaps excepted) and some setules.

Lower Antennæ not nearly so long as the peduncles of the upper, but longer than the

first two joints of those peduncles; the first and second joints short, the second with a very small decurrent gland-cone; the third joint longer than the preceding two together; the fourth longer than the first of the upper antennæ, fringed with slender rather distant setæ; the fifth joint longer than the preceding, fringed like it, not nearly so long as the second joint of the upper antennæ; the flagellum little more than half the length of the fourth and not nearly half the length of the fifth joint of the peduncle, the first joint about three times as long as the second, having spinules at four points of each margin, the second joint having one or two setules at its apex.

Mouth Organs.—As far as could be observed the mouth-organs are in near agreement with those of *Protella phasma* (Montagu), as figured by Mayer.[1] The specimen was mounted in Canada balsam by Willemoes Suhm on the voyage, and I have not dissected it.

First Gnathopods attached close to the base of the maxillipeds; the first joint a little longer than the hand, narrow at the neck, widening distally, having a single spine on the surface at a distance from the apex of the hind margin, one at the apex of the front margin, one at its centre, and a smaller one higher up; the second joint a little longer than broad, with some apical spines behind; the third joint longer than the second, with a group of slender spines near the rounded hind corner, the front apex acute, resting on the wrist; the wrist a long triangle, as long as the hand, with apical spines in front, and five groups of slender spines along the distal half of the breast; the hand more or less oval, wider at the base than distally, and wider at the base than the distal end of the wrist, with five rows of spines on the surface near the front margin; the palm occupying almost all the hind margin, fringed with setules interspersed with some slender spines; the elongate finger matching the palm, its curved tip reaching even beyond the small palmar spine.

Second Gnathopods attached not far from the proximal end of the segment; the rudimentary side-plates deeper in front than behind; having just in advance a small piece bulbous at the base and distally spine-like, the distal part seemingly adnate to the first joint of the limb; the first joint shorter than the hand, narrowing a little below the proximal end, then widening for the distal half which is channelled in front; the second joint scarcely longer than broad; the third joint little longer than the second, distally rounded, this like the two preceding joints having a slender spine at the hinder apex; the wrist very small, triangular, about as long as, and lying close beside the third joint; the hand large, more or less oval, more than twice as long as broad, with small spines distantly spread along the convex front margin; the hind margin apart from the palm short, carrying a few small setæ; the palm long, defined by a tooth or projection carrying a palmar spine, fringed by setiform spines and spinules, an excavation at a little distance from the finger hinge forming a narrow tooth on one side, and on the side nearer the hinge an angular point rather than a tooth; the finger large and long, its curved apex closing

[1] Die Caprelliden, Taf. v. figs. 19–21.

down beside the palmar spine, its inner margin having a few hairs, the dorsal cilium minute, close to the hinge.

First Peræopods attached behind the centre of the segment. The branchial vesicles large, oval. The marsupial plates much larger than the branchial vesicles; the free margin fringed with setæ. The limb consisting of a long slender joint attached by a small hinge, the length about two-thirds, the breadth about one-third, that of the branchial vesicles, the rounded apex carrying several setules.

Second Peræopods attached in front of the centre of the segment, the details similar to those of the preceding pair, except that no setæ were perceived on the marsupial plates.

Third Peræopods attached nearly at the distal end of the segment, with the little smooth-rimmed oval genital-valves projecting from the ventral surface of the segment just in advance of them. The side-plates as usual quite small; the first joint widening a little distally, with some spines at the apex and one or two spines higher up on the front margin; the second joint scarcely longer than broad, with some apical spines; the third joint not quite so long as the first, widening a little distally, with apical spines and a small group of spines near the middle of the front margin; the fourth joint as long as the first, with spines at four points of the front margin and many round the apex; the fifth joint about as long as the fourth, with spinules at various points of the hind margin, the front margin smooth for the first fourth of its length or a little more, then forming an advanced point, on which are fixed a pair of rather slender spines apically serrate; below these the margin is bordered with spines of various lengths and thicknesses, and setiform spines are set round the sloping sides of the apex; the finger is strong, curved, capable of reaching the pair of spines on the advanced point of the hand, its inner margin carrying a few hairs.

Fourth Peræopods attached quite at the distal end of the segment, similar in armature and general structure to the preceding pair, but the second joint longer than broad, the third joint rather longer than the fourth, the fourth considerably shorter than the first, the fifth longer than the first.

Fifth Peræopods attached at the distal end of the segment, resembling the preceding pair in structure, but exceeding these and the third pair in size, to some extent in length but especially in breadth.

Uropods.—Viewed laterally the diminutive pleon presents the appearance of a basal joint, the distal margin of which is (laterally) emarginate, having a pair of small oval appendages attached at the upper end of the emargination, and folding back so as nearly to reach its lower end. There are some minute setules at the apex in these appendages.

Length.—In a slightly bent position the mounted specimen measures, from the front of the head to the pleon, a quarter of an inch.

Locality.—The label gives "Caprella, 28 fathoms, Arafura Sea." On the glass slide there is the monogram S.

Station 188, Arafura Sea, September 10, 1874; depth, 28 fathoms; bottom, green mud. One specimen (mounted).

Remarks.—Dana's specimens were "from thirty-one fathoms water, in Balabac Passage, attached to a Plumularia and a Gorgonia." He gives the colour as "pale yellowish." In Mr. Haswell's figures and descriptions of *Protella australis* I can find little to distinguish it from Dana's species, except in "the presence of a pair of short, acute, forwardly directed spines on the head."[1] But in the earlier account[2] he says "Cephalon armed above with a single short, anteriorly directed spine," and again "the cephalic spine is sometimes rudimentary." In the statement that the flagellum of the lower antennæ "is composed of six articuli,"[3] which I have already noticed as contrary to the generic character of *Protella*, there must, I think, be some misapprehension. In the original account[4] Mr. Haswell only says "flagellum very short." One point, however, remains: Mr. Haswell says, "the branchiæ are long oval; the corresponding appendages are distinct, between a third and a half the length of the branchiæ."[5] In Dana's figures and in the Challenger specimen the rudimentary peræopods are much longer in proportion to the branchial vesicles than in Mr. Haswell's description of his species; but in Dana's figures the legs are proportionately much larger than in the Challenger specimen, so that probably these appendages are very variable in size within the species. The other details given by Mr. Haswell agree so well with Dana's figures and with the specimen here described, that they strongly tend to confirm the opinion expressed by Mayer[6] that *Protella australis* is a synonym of *Protella gracilis*.

Genus *Æginella*, Boeck, 1860.

1843. *Ægina*, Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 496.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 807, 822.
1854. „ Stimpson, Marine Invertebrates of Grand Manan, p. 44.
1855. *Caprella*, Bell and Westwood, The Last of the Arctic Voyages, p. 407.
1860. *Ægina*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 670.
1860. *Æginella*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 670.
1862. *Caprella* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 353.
1863. *Æginella*, M. Sars, Nyt Mag. for Naturvidenskaberne, Bd. xii. Hfte 3, p. 290.
1870. *Ægina*, Boeck, Crust. amph. bor. et arct., p. 190.
1870. *Æginella*, Boeck, Crust. amph. bor. et arct., p. 192.
1876. *Ægina*, Boeck, De Skand. og Arkt. Amph., p. 679.
1876. *Æginella*, Boeck, De Skand. og Arkt. Amph., p. 684.

[1] Revision of the Australian Læmodipoda, pp. 5, 6 (sep. copy), pl. xlix. figs. 2–4, *Proc. Linn. Soc. N.S.W.*, vol. ix. pt. iv., 1885. In the Plate the figure of the peræopod is evidently fig. 5, which is not included in the "Explanation of the Plates"; fig. 4, which is there said to represent "Pereiopoda of *Protella australis*," must be a second gnathopod.

[2] *Proc. Linn. Soc. N.S.W.*, vol. iv. p. 276, 1880.

[3] Revision of the Australian Læmodipoda, p. 6.

[4] *Proc. Linn. Soc. N.S.W.*, vol. iv. p. 276.

[5] Revision of the Australian Læmodipoda, p. 6.

[6] Die Caprelliden, p. 31.

1876. *Ægina*, Sars, Prodr. descr. crust. et pycn., p. 361.
1877. „ Miers, Ann. and Mag. Nat. Hist., ser. 4, vol. xx.
1882. „ Mayer, Die Caprelliden, p. 33.
1882. *Æginella*, Mayer, Die Caprelliden, p. 36.
1885. *Ægina*, Sars, Den norske Nordhavs-Exp., p. 228.
1887. „ Hansen, Oversigt over de paa Dijmphna-Togtet indsamlede Krebsdyr.

Since the name *Ægina* given by Krøyer was preoccupied, and Mayer has shown that in all probability Boeck's genus *Æginella* is identical with *Ægina*, the latter name will take the place of the earlier. For Krøyer's definition, see Note on Krøyer, 1843 (p. 202), and for Boeck's, see Note on Boeck, 1860 (p. 325). The definition will at present stand as follows :—

Mandibles with a three-jointed palp.

Lower Antennæ with a two-jointed flagellum.

First and *Second Peræopods* wanting, the other limbs of the peræon normal.

Branchial Vesicles only on the third and fourth segments of the peræon.

Pleon one-jointed.

The only distinction drawn by Boeck between *Ægina*, Krøyer, and his own *Æginella* was that in the former the first uropods were two-jointed, and in the latter one-jointed. Mayer thinks that this distinction may have been due to an error of observation. In any case it may, I think, be allowed to rank as not more than a specific difference. In the new species here assigned to the genus the uropods were not present.

Æginella tristanensis, n. sp. (Pl. CXLIII.).

Head with the dorsal margin rounded in front; behind the middle there rises a little blunt tooth, directed slightly forwards, and having a cilium at its base behind; the first segment of the peræon is intimately coalesced with the head, its dorsal margin shorter, its ventral longer than the head; the second segment shorter than the third, dilated in front except at the neck, with a minute tubercle dorsally in front of the centre; the third segment longer than the fourth; the fourth than the fifth; the fifth than the second; the sixth longer than the seventh, these two together not quite so long as the second. Pleon as in *Caprellinopsis tristanensis*.

Eyes small, round, with about eighteen ocelli, not all of the same size, nor set very close together.

Upper Antennæ.—First joint nearly as long as the top of the head; second nearly as long as the first and third together; third more than half the length of the first, widening distally; flagellum rather longer than the peduncle, consisting of seven elongate unequal joints, each except the first with a slender apical filament and some cilia, the first joint the longest, longer than the third joint of the peduncle, the second joint the shortest, less than half the length of the first.

Lower Antennæ very little longer than the peduncle of the upper antennæ, the first two joints closely coalesced, the gland-cone small, scarcely decurrent, the third joint very little longer than the two preceding united; the fourth joint considerably longer than the three preceding together; the fifth a little longer than the fourth; the flagellum not so long as the fourth joint of the peduncle, the first joint longer than the second, each carrying apical cilia or setules, the second not by any means rudimentary, as would be required by Krøyer's definition of the genus *Ægina*.

Mandibles.—The details not clearly made out; the cutting plate cut into several teeth; the palp elongate, the first joint a good deal longer than broad, the second more than twice as long as the first, with one or two setules near the centre of the front margin; the third joint rather longer than the second, with four or five setæ or slender spines on the oblique apical margin.

First Maxillæ.—The outer plate with five or six small spines on the apical margin; the palp with three or four spinules on the apical margin of the second joint, and one or two setules on the surface or outer margin.

Second Maxillæ.—Inner plate small, much shorter than the outer, with four or five apical setules; the outer plate with five or six apical setules or slender spines, longer than those on the inner plate.

Maxillipeds.—Inner plates very small, scarcely reaching the base of the first joint of the palp, with a couple of setules on the rounded apex; the outer plates reaching a little beyond the first joint of the palp, with two setules on the apex and three on the inner margin; the first joint of the palp the shortest, the second longer than the third, the third with setules about the apex, the fourth not much, if at all, shorter than the second, curved, acute.

There is a great resemblance between the mouth-organs of this species and those of *Caprellinopsis tristanensis*, but the minuteness of the specimens made a thoroughly satisfactory comparison of the details impracticable.

First Gnathopods attached close to the maxillipeds. The first joint about as long as the hand, widening a little distally, the front margin nearly straight; the second joint scarcely longer than broad, with a cilium near the apex behind; the third joint longer than the second, with two spines and a seta at the tolerably broad apex; the wrist about as long as the third joint, widening distally, and on the lower margin armed with three spines; the hand much longer and broader than the wrist, more or less oval, the front margin nearly three times as long as the hind margin without the long oblique palm, which is defined by some very small palmar spines and fringed with a few setules; there are two or three small groups of setiform spines on the surface near the front margin; the finger is long, curved, acute, matching the palm, carrying a dorsal cilium near the hinge, and a couple of cilia at the base of the short nail or nail-like tip.

Second Gnathopods.—As with the other limbs there is a rudimentary side-plate.

The attachment is very near the proximal end of the segment, the first joint subequal in length to the hand, little widened distally; the second joint little longer than wide; the third joint slightly longer than the second, with a rather broad, flat, distal margin, having a cilium near its hinder apex; the wrist very small, triangular, shorter than the third joint, with only the front margin free; the hand large, twice as long as its greatest breadth, the position of the hind margin entirely occupied by the palm, which is defined by a slightly projecting point, within which a palmar spine is planted; the palm border is smooth except for a tooth below the centre pointing towards the hinge; there are setæ or setules at various points on either side of the edge of the palm; the finger matches the palm, and is therefore long; it is also broad, except at the acute tip, thin-edged, and smooth, except for a few microscopic hairs or cilia; the dorsal cilium is not very close to the hinge.

First and *Second Peræopods* wanting. The branchial vesicles small, oval, closely attached to their respective segments a little behind the centre.

Third, *Fourth*, and *Fifth Peræopods* all missing from the specimen, with the exception of the rudimentary side-plates and the broken hinges. The place of attachment in each case is at the distal end of the segment. In the lateral view of the pleon, fig. *Pl.*, the letters *prp.*[5] refer to the place of attachment of the missing fifth peræopods.

Uropods missing. On the ventral side of the very minute pleon there is a cilium. There is an appearance of a very small second joint partially telescoped within the broader first joint, but this I imagine to be the abdominal valve, which, according to Mayer, has often been mistaken for a second joint.

Length.—The specimen, in the position figured, measured without the antennæ about one-seventh of an inch.

Locality.—Station 135c, off Nightingale Island, Tristan da Cunha, October 17, 1873; depth, 110 fathoms. One specimen.

Remark.—The specific name refers to the place of capture.

Genus *Caprella*, Lamarck, 1801.

1801. *Caprella*, Lamarck, Systême des Anim. sans vert.
1802. *Liparis*, Bosc, Hist. nat. des Crust., t. i. p. 79.
1802. *Caprella*, Bosc, Hist. nat. des Crust., t. ii. p. 153.
1802. „ Latreille, Hist. nat. des Crust. et des Insectes, vol. iii.
1810. „ Latreille, Consid. gén. sur l'ordre nat. des Crust., des Arachn., et des Insectes, p. 104.
1813. „ Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 403.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii.
1816. „ Latreille, Nouveau Dict. d'hist. nat., vol. v.
1816. „ Risso, Hist. nat. des Crust. des environs de Nice, p. 129.
1817. „ Latreille, Le Règne animal, t. iii.

1818. *Caprella*, Lamarck, Hist. nat. des Anim. sans vert., t. v.
1818. „ Say, Journ. Acad. Nat. Sci. Philad., vol. i. pt. ii.
1825. *Capreola*, De Brébisson, Catal. Méthod. des Crust. dans le département du Calvados.
1825. *Caprellæ*, Desmarest, Consid. gén. sur les Crust., p. 277.
1825. „ Guérin, Encycl. Méth. Hist. Nat., t. x. (under *Proton*).
1826. „ Ross, Parry's Third Voyage, Appendix.
1828. „ Ross, Narrative of an attempt to reach the North Pole, App. Zool., p. 203.
1828. „ Zenker, Das thierische Leben und seine Formen, p. 342.
1829. „ Latreille, Le Règne Animal, t. iv.
1830. „ Desmarest, Bosc's Manuel de l'hist. nat. des Crust., t. ii., new edition.
1830. „ Eschscholtz, Kotzebue's new voyage round the World, Appendix, p. 326.
1835. „ Johnston, The Magazine of Natural History, vol. viii.
1836. „ Guérin-Méneville, Iconographie du Règne Animal, t. iii.
1836. „ Templeton, Trans. Entom. Soc. Lond., vol. i. pt. iii. p. 191.
1837. „ Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. „ Milne-Edwards, Lamarck's Hist. Nat. des Anim. sans vert., Deuxième Éd., t. v.
1838. „ Krøyer, Grønland's Amfipoder, p. 318.
1840. „ Milne-Edwards, Hist. nat. des Crust., t. iii. p. 105.
1840. „ Lucas, Hist. nat. des Crust., p. 224.
1841. „ Gould, Report on the Invertebrata of Massachusetts.
1842. „ Goodsir, The Edinburgh New Philosophical Journal, vol. xxxiii. p. 183.
1843. „ Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 497.
1843. „ Rathke, Beiträge zur Fauna Norwegens, p. 94.
1844. „ O. G. Costa, Catal. de' Crost. racc. nel golfo di Taranto, p. 74.
1844. „ De Kay, Zoology of New York, pt. vi., Crustacea.
1847. „ Frey and Leuckart, Beiträge zur Kenntniss wirbelloser Thiere, p. 100.
1847. „ Nardo, Sinonimia moderna Chiereghini, p. 10.
1847. „ W. Thompson, Ann. and Mag. Nat. Hist., vol. xx. p. 244.
1847. „ White, List of the specimens of Crustacea, Brit. Mus., p. 91.
1849. „ Lucas, Exploration scientifique de l'Algérie, p. 58.
1849. „ (*pars*), Nicolet, Hist. fis. y pol. de Chile por Claudio Gay, vol. iii.
1850. „ de Haan, Fauna Japonica, tab. lxv.
1850. „ White, List of the specimens of Brit. Animals in Brit. Mus., p. 59.
1851. „ Brandt, Middendorff's Reise, Bd. ii. Th. i. p. 144 (68).
1851. „ Liljeborg, Norges Crustaceer, No. 70.
1852. „ Couch, Trans. Nat. Hist. Penzance, vol. ii.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 807.
1852. „ White, Sutherland's Journal, Appendix, vol. ii. p. 207.
1853. „ Gosse, A Naturalist's Rambles on the Devonshire Coast, p. 379.
1854. „ Stimpson, Synopsis Marine Invert. Grand Manan, p. 44.
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1856. „ Spence Bate, Report Brit. Assoc. for 1855.
1857. „ Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 20.
1857. „ Stimpson, Proc. Calif. Acad. Nat. Sci., vol. i. p. 95.
1857. „ White, Popular History of British Crustacea, p. 214.
1858–74. „ Chenu and Desmarest, L'Encycl. d'Hist. Nat., p. 49.
1859. „ Gervais and van Beneden, Zoologie Médicale, t. i.

1860. *Caprella*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 674.
1860. „ v. Vollenhoven, Naturlijke Historie van Nederland.
1861. „ P. J. van Beneden, Recherches sur les Crust. du litt. de Belgique.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 353.
1863. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 49.
1863. „ Claparède, Beobacht. über Anat. und Entwick. wirbelloser Thiere, p. 101.
1864. „ Grube, Die Insel Lussin und ihre Meeresfauna, p. 75.
1864. „ Stimpson, Marine Invert. from Puget Sound.
1865. „ Goës, Crust. amph. maris Spetsb., p. 18.
1866. „ Dohrn, Zur Naturgeschichte der Caprellen.
1866. „ Heller, Amph. des Adriatischen Meeres, p. 52.
1868. „ Czerniavski, Materialia ad Zoographiam Ponticam comp., p. 91.
1868. „ A. Milne-Edwards, Nouv. Arch. du Muséum d'hist. nat. de Paris, t. iv. p. 89.
1869. „ Nardo, Annotazioni illustranti 54 specie crost. Adriat., p. 332.
1870. „ Boeck, Crust. amph. bor. et arct., p. 193.
1872. „ Boeck, Bidrag til Californiens Amphipodefauna, p. 35.
1873. „ Wyville Thomson, The Depths of the Sea, p. 126.
1874. „ Hoffmann, Recherches sur la Faune de Madagascar et de ses dépendances.
1874. „ M'Intosh, Ann. and Mag. Nat. Hist., ser. 4, vol. xiv.
1874. „ Verrill and Smith, Invert. Animals of Vineyard Sound, p. 567 (273).
1875. „ Lockington, Proc. Calif. Acad. of Sciences, vol. v. p. 404.
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1875. „ Schiødte, Krebsdyrenes Sugemund, Naturh. Tidsskr., R. 3, Bd. x. p. 224.
1876. „ Boeck, De Skand. og Arkt. Amph., p. 686.
1876. „ Sars, Prodromus Descr. Crust. et Pycn. Exp. Norv., p. 362.
1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 168.
1877. „ Stalio, Catalogo dei Crost. dell' Adriatico, p. 195.
1878. „ Spence Bate, Crustacea in Couch's Cornish Fauna revised and added to, p. 61.
1878. „ Gamroth, Naturgeschichte der Caprellen, Zeitschr. f. wiss. Zool., Bd. xxxi. p. 101.
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1878. „ Kirk, Ann. and Mag. Nat. Hist., ser. 5, vol. ii. p. 465.
1878. „ Stebbing, Ann. and Mag. Nat. Hist., ser. 5, vol. i. p. 31.
1879. „ Haller, Læmod. filiformes, Zeitschr. f. wiss. Zool., Bd. xxxiii. p. 403.
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1879. „ Sars, Crust. et Pycn. nova, p. 465.
1879. „ G. M. Thomson, Trans. New Zealand Inst., vol. xi. p. 246.
1880. „ Claus, Grundzüge der Zoologie, 4te Aufl.
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1882. „ Sars, Oversigt af Norges Crustaceer, pp. 33, 114.
1884. „ Blanc, Die Amphipoden der Kieler Bucht, pp. 51, 88.
1884. „ Kingsley, The Standard Natural History, vol. ii.
1884. „ Miers, Report on Zool. Coll. H.M.S. "Alert," p. 320.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, p. 387.
1885. „ Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract), p. 7.
1885. „ Sars, Den norske Nordhavs-Exp., p. 222.
1887. „ Hansen, Oversigt over de paa Dijmphna-Togtet indsamlede Krebsdyr.

For the original definition of the genus, see Note on Lamarck, 1801 (p. 66); Mayer characterises it as follows :—

"The third and fourth segments of the *Peræon* are without legs.

"The *Mandible* is without a palp.

"There are only two pairs of *Branchial Vesicles*, these being attached to the third and fourth segments of the peræon.

"The *Lower Antennæ* have a two-jointed flagellum."

He adds that the dimorphism, so strongly developed in many species of the genus, to which Krøyer called attention, is brought about by the circumstance that in the male during growth an enormous elongation of the front part of the body often takes place, sometimes bringing the second gnathopods not only near to the distal end of their own segment, but sometimes to the middle of the animal's body. In this change the females and young males are not concerned. He considers that Haller has pointed out a useful distinction between species which have on the lower antennæ motor-setæ (Ruderborsten), and those which have sensitive setæ (Sinnesborsten). Another mode of grouping species he finds in the distinction between those which in the adult male have the first joint of the second gnathopods very long, and those in which it remains short. Of minor and less decisive distinctions, he refers to the length of the upper antennæ and the number of joints that they have in the flagellum, and to the position of the palmar spines on the last three pairs of peræopods.

Caprella equilibra, Say, 1818.

1818.	*Caprella equilibra*,	Say, Journ. Acad. Nat. Sci. Philad., vol. i.
1843.	„	*Januarii*,[1] Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 499, tab. vi. figs. 14–20.
1847.	„	*equilibra*, White, List of Crust. in Brit. Mus., p. 92.
1850.	„	*Kröyeri* (?), de Haan, Fauna Japonica.
1852.	„	*Januarii*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 819, pl. lv. fig. 2.
1860.	„	*Esmarkii*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 674.
1860.	„	*laticornis*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 675.
1862.	„	*æquilibra*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 362, pl. lvii. fig. 5.
1866.	„	„ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 71 (with figure).
1866.	„	*monacantha*, Heller, Beiträge zur näheren Kenntniss der Amph. des Adriat. Meeres, p. 54, taf. iv. figs. 17–19.
1870.	„	*laticornis*, Boeck, Crust. amph. bor. et arct., p. 194 (274).
1870.	„	*Esmarkii*, Boeck, Crust. amph. bor. et arct., p. 195 (275).
1876.	„	*laticornis*, Boeck, De Skand. og Arkt. Amph., p. 689, pl. xxxii. fig. 10.
1876.	„	*Esmarkii*, Boeck, De Skand. og Arkt. Amph., p. 693, pl. xxxii. fig. 5.
1878.	„	*æquilibra*, Gamroth, Naturgeschichte der Caprellen, Zeitschr. f. wiss. Zool., Bd. xxxi. p. 101.

[1] Spence Bate and Mayer both refer for this species to the Voy. en Scand., pl. vi. fig. 15, but there is no species so named on that Plate or in any part of the work referred to. The reference in the Brit. Mus. Catal. Amph. Crust., p. 362, was probably intended for a reference to the *Naturh. Tidsskrift*, which Mayer gives correctly.

1879. *Caprella æquilibra*, Haller, Læmodipodes filiformes, Zeitschr. f. Wiss. Zool., Bd. xxxiii. p. 404.
1879. „ *caudata*, G. M. Thomson, Trans. New Zealand Inst., vol. xi. p. 246, pl. x.D, fig. 5.
1880. „ *obesa*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 348, pl. xxiv. fig. 1.
1882. „ „ Haswell, Catal. Australian Crust., p. 314.
1882. „ *æquilibra*, Mayer, Die Caprelliden, p. 45, taf. i. fig. 7, taf. ii. figs. 1–11, taf. iv. figs. 20–25, taf. v. figs. 16–18.
1884. „ „ Miers, Report on Zool. Coll. H.M.S. "Alert," pp. 180, 320.
1885. „ „ Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. (extract p. 7).
1886. „ „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 142.

A few notes are added in regard to this widely distributed and often described species for the identification of the Challenger specimens.

Upper Antennæ with the peduncle stout, the third joint longer than the first, each of these shorter than the second; the flagellum abruptly narrower than the peduncle, of twelve joints, almost all of which are distally expanded, and all of them together not nearly as long as the third joint of the peduncle. In the female specimen examined the flagellum was less conspicuously narrower than the third joint of the peduncle and exceeded that joint in length.

Lower Antennæ.—The flagellum nearly as long as the fourth or the fifth joint of the peduncle, strongly fringed like them, with short curved spines on the distal part of the long first joint, which is six or seven times as long as the second, this terminal joint being very narrow as well as short. In the female the flagellum is quite as long as the fifth joint of the peduncle.

Upper Lip bilobed.

Mandibles.—Cutting edge divided into five strong but very unequal teeth; secondary plate of the left mandible strong, divided like the principal plate; secondary plate of the right mandible slighter, with a prominent slender distal tooth, and the upper edge only slightly divided into two or three inconspicuous denticles; spine-row on the left mandible of three, on the right of two, stout curved feathered spines; molar tubercle strong, with a powerful tooth on the front border, giving the crown a very irregular outline.

Lower Lip.—Principal lobes strongly dehiscent, only a little advanced in front of the inner lobes which are fully as large as the outer, and fill up almost all the gap between them, but the inner lobes about halfway from the base become coalescent with one another, and their outer margins not very far from the rounded apical borders seem to lose themselves on the sides of the principal lobes; the mandibular processes not divergent, apically narrow.

First Maxillæ.—Inner plate undeveloped; the outer plate smaller than the palp, with the dentate distal margin carrying seven spines, all of them having one or more strong lateral denticles; the first joint of the palp short, the second widening towards the dentate obliquely convex distal margin, which is fringed with thirteen slender spines, none very long, the outermost the longest, the innermost six slenderer than the rest; on

the surface near the apical margin and the distal part of the inner margin there are fourteen slender spines of greater length than those on the apex.

Second Maxillæ.—Inner plate shorter and more oval than the outer, with many slender spines round the apical margin and descending the inner margin for some distance; the outer plate oblong, with many long spines on the apical margin, of gradually greater length as they approach the outer corner, where there is one short spine; the apical margin for the most part truncate, but with an oblique portion where it joins the inner margin.

Maxillipeds.—The inner plates small, scarcely reaching beyond the base of the first joint of the palp, widening distally, with two long slightly feathered spines near the distal part of the inner margin, and seven on or near the broad slightly denticulate distal margin, which also carries two or perhaps three distant spine-teeth; the angle where the distal and inner margins meet is finely but irregularly pectinate; the outer plates small, reaching little beyond the first joint of the palp, with eight rather long spine-teeth on the straight but denticulate inner margin, and on the oblique denticulate apical margin a spine-tooth at the inner corner, and a long curved spine at the outer; the first joint of the palp short and stout, with spines on the inner margin, and one below the centre of the outer; the second joint stouter than the first, scarcely twice as long as broad, the inner margin fringed with long spines, of which there are two near the outer apex; the third joint intermediate in length between the second and first, its distal half crowded with spines, especially on the inner surface; the finger abruptly narrower, not very much shorter, than the third joint, with a short dorsal cilium near the hinge, its surface covered with rows of minutely pectinate scales or appearances that may be so described; there is a setule on the inner margin at the base of the slightly narrowed furred tip.

The limbs are in close agreement with the figures and descriptions given by Mayer for this species.

Length.—Some of the male specimens were about an inch long from the rostrum to the pleon, with the gnathopods inserted behind the centre of the body; in these specimens the upper antennæ were more than half an inch long, the total outstretched length including the antennæ and hinder peræopods not being less than an inch and three-quarters.

Locality.—"Screw of ship, off Cape of Good Hope, 18 Dec. 1873" (corresponding with Station 142; lat. 35° 4′ S., long. 18° 37′ E.). Several specimens of both sexes and of various sizes.

Samboangan, Philippines, February 18, 1875; lat. 2° 56′ N., long. 134° 11′ E. One specimen, male; total length about seven-tenths of an inch.

Caprella scaura, Templeton, 1836 (Pl. CXLIV.).

1836. *Caprella scaura*, Templeton, Trans. Entom. Soc. Lond., vol. i. pt. iii. p. 191, pl. xx. fig. 6.
1836. „ *nodosa*, Templeton, Trans. Entom. Soc. Lond., vol. i. pt. iii. p. 192, pl. xxi. fig. 7.
1840. „ *scaura*, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 107.
1840.[1] „ *nodosa*, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 108.
1852. „ *attenuata*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 817, pl. lv. fig. 1, *a–g*.
1855-6. „ *gracilis* (*?*), Stimpson, New Marine Invert. from the Chinese and Japanese Seas.
1857. „ *californica* (*?*), Stimpson, Proc. Calif. Acad. Nat. Sci., vol. i. p. 95 (89).
1857. „ *californica* (*?*), Stimpson, Journal Boston Soc. Nat. Hist., vol. vi. p. 73.
1862. „ *scaura*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 355, pl. lvi. fig. 4.
1862. „ *nodosa*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 357, pl. lvi. fig. 7.
1862. „ *attenuata*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 364, pl. lvii. fig. 7.
1862. „ *gracilis*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 365.
1872. „ *californica*, Boeck, Bidrag til Californiens Amphipodefauna, p. 35.
1874. „ *scaura*, Hoffmann, Recherches sur la Faune de Madagascar et de ses dépendances.
1874. „ *nodosa*, Hoffmann, Recherches sur la Faune de Madagascar et de ses dépendances.
1882. „ *scaura*, Mayer, Die Caprelliden, p. 65.
1882. „ *attenuata*, Mayer, Die Caprelliden, p. 67, figs. 24, 25.
1882. „ *californica*, Mayer, Die Caprelliden, p. 68.
1882. „ *gracilis*, Mayer, Die Caprelliden, p. 70.
1884. „ *attenuata* (*?*), Miers, Report on Zool. Coll. H.M.S. "Alert," p. 320.

In regard to the above-given synonymy I accept Mayer's conclusion that the minute *Caprella nodosa* of Templeton is no doubt the young of *Caprella scaura;* whether it is the female form is perhaps not easy to determine in regard to so small a specimen as that which Templeton describes. Mayer is strongly inclined to make Dana's *Caprella attenuata* a synonym of *Caprella scaura*. Dana's species was found at Rio de Janeiro, and Mayer has received specimens both from Rio and from Australia (Port Jackson). Templeton's species was found at Mauritius; the Challenger specimens came from the neighbourhood of Japan, and agree so closely with the figures and descriptions given by Templeton and Dana for the male and by Mayer for both sexes, that there can be no further doubt about the identity of *Caprella attenuata* with *Caprella scaura*, the species evidently having a very wide distribution. As Mayer's figures of the two sexes have already shown, there is in this species the curious peculiarity that the female is spiny or tuberculated, while the male except for the cephalic tooth or horn is very nearly smooth. In the species which Boeck calls "*Caprella californica*, Stimpson," taken in the neighbourhood of San Francisco, there is the same peculiarity, and allowing for a certain amount of variation, such as is almost certain to occur where one sex is smooth and the other spiny, Boeck's description seems to justify the addition of *Caprella californica* to the synonymy of *Caprella scaura*. It is to the following effect:—

"The animal's length is in the ♂ from head to pleon 16^{mm}, in the ♀ $13–14^{mm}$. The body is as in *C. linearis* Lin. (*C. lobata* Müll.) very different in ♂ and ♀. In the former it is

[1] Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. p. 504, 1843, refers to *Caprella scaura* and *Caprella nodosa* in a footnote.

especially elongate, the head is above armed with a strongly forward curved horn. The first and second segments of the body are about equally long, the latter somewhat thickened towards the hinder end, where the second gnathopods are fastened. The two following segments are very short, of equal length, and together as long or slightly longer than the second segment; the fifth segment is longer than the preceding, but shorter than the two preceding together, and much longer than the two last segments together. In the younger ♂ on the other hand the first and second segments of the body are not so long, yet longer than the third segment. In the ♀ the first segment is tolerably short, much shorter than the second segment, which is thickest in the front part, where the first [second] gnathopods are fastened; the third and fourth segments together are much longer than the other segments and furnished with a large brood-pouch. The three hinder segments are in the female sometimes furnished with spines, which were not found in any adult specimen of the ♂, but only in a younger one. The *upper antennæ* are in the male especially elongate, and when bent back reach the fifth segment of the body. The first joint of the peduncle is more than a third shorter, but much thicker than the second and about as long as the very thin third joint. The flagellum is longer than the third joint of the peduncle and consists of 16 joints in the ♂ and 10 in the ♀. The *lower antennæ* are in the ♂ much shorter than the upper, and reach to somewhat beyond the middle of the second joint of the peduncle of the upper antennæ; the third and fourth [? fourth and fifth] joints are about equally long, and the flagellum, the second joint of which is scarcely a fourth of the length of the first joint, is slightly longer than the last joint of the peduncle. The antennæ are furnished with long groups of setæ on the lower margin. In the ♀ on the other hand the antennæ, especially the upper, are much shorter than in the ♂ and when bent back do not reach the fifth segment of the body; the second joint of the peduncle is not much longer than the first, and the third is much shorter. In the younger ♂ also the third joint of the peduncle is shorter than the first. The *lower antennæ* are in the ♀ as compared with the ♂ much longer and reach beyond the third joint of the peduncle of the upper antennæ. The *first gnathopods* are alike in both sexes and completely agree with those of *C. linearis*. The *second gnathopods* are in the male especially elongate. The first joint is nearly as long as the segment of the body to which it is fastened, and is prolonged downwards on the front apex in a strong spine. The hand is as large as the first joint, becomes broader outwards and is nearly club-shaped and rounded at the outer extremity; the upper half of the hinder margin is armed with three teeth, the two uppermost small, while the third is broad, triangular. The finger, which is attached at the end of the hinder margin, is very strong and armed with a little tooth at the upper part of the hinder margin. In the younger ♂ the first joint of the gnathopods is shorter than the second segment of the body and shorter than the hand, which is not so narrow. In the ♀ these gnathopods

are very short; the first joint is much shorter than the second segment of the body, and much shorter than the oval hand, which is only armed on the hinder longer margin with two small teeth. The branchial vesicles are of an elongate oval form. The three hinder pairs of feet are successively longer, and are shorter, with much broader joints, than in *C. linearis*. That pair, which is attached to the fifth segment of the body, is the shortest; its first joint is only a little longer than broad, and the lower hinder angle is outdrawn into a spine; the fourth joint is about as long as broad. The hand is somewhat shorter than the preceding joints together and is somewhat more than double as long as broad. The palm is furnished with setæ. On the last legs the joints are much longer and narrower." With this should be compared the description given as follows by Stimpson :—

"The body in this species is slender. The antennæ are exceedingly variable in their proportions; the flagella of the superior ones 10–15 articulate; inferior ones subpediform. A more or less developed spine, which curves forward, and is sometimes of considerable length, is placed upon the dorsal surface at the anterior extremity of the first thoracic segment. Hand of the second pair of feet generally three-toothed on the inner surface; teeth (in full-grown specimens) about equal in size, and placed mostly toward the outer extremity of the palm. Two or three sharp tubercles along each of the sides of the branchiferous segments; and a short dorsal spine on each of the three posterior segments. Hands of posterior feet slender. Color, variable. Length, one-inch; breadth, about 0·03 inch. Found on seaweeds, etc., below low-water mark in San Francisco Bay, near its entrance."

It is probable that by "the anterior extremity of the first thoracic segment" Stimpson intends the head. Boeck did not find in his specimens the sharp tubercles on each side of the branchiferous segments, and does not consider that Stimpson's description of the hand of the second gnathopods agrees with his own.

Guérin-Méneville's *Caprella tuberculata*, 1836, and Lockington's *Caprella spinosa*, 1875, if the types are accessible, may eventually be found to belong to this species, or to be varieties of it.

As observed in the Challenger specimens, the male of this species attains a very considerable length, measuring a good deal more than one inch without the antennæ and hind peræopods. The forward-directed horn on the short head is small; the proportions of the segments vary as usual with the size of the specimen; in the longest specimen the first segment measured not less than three-tenths of an inch and was even longer than the second segment, though these proportions in other specimens were reversed; the suture between the head and the first segment seems to be almost or quite continuous; the second segment is much longer than the third; the third is subequal to the fourth, the two together longer than the second, and each having a small dorsal tooth at the extremity, though in some specimens this, especially on the

third segment, is evanescent; these two segments have also one or two lateral teeth or tubercles behind the place of attachment of the branchial vesicles; the fifth segment is longer than the fourth, with some very inconspicuous raised points on the back; the sixth and seventh segments are subequal, about as broad as long, together shorter than any one of the preceding segments, inconspicuously tubercled on the back.

Eyes small, round, situated on the advanced lateral lobes of the head.

Upper Antennæ in the largest specimen about seven-tenths of an inch in length; the first joint of the peduncle thicker than the second, more than half its length; the second joint with the distal part rather abruptly thicker than the proximal; the third joint thinner than the second, in the longest specimen subequal to it in length, in others intermediate in length between that and the first, widened at the distal end; there are setules and cilia scattered over the whole peduncle; the flagellum a little shorter or a little longer than the third joint of the peduncle, with twelve joints in a dissected specimen, of which the first was the stoutest, nearly equal in length to the remaining eleven together; of these the first nine are widened distally, each carrying an apical filament and setules, the serrate lower margin of the first joint being similarly furnished at nine points.

Lower Antennæ not reaching the end of the second joint of the peduncle of the upper antennæ; in structure as in the female.

Mouth Organs as in the female.

First Gnathopods as in the female.

Second Gnathopods attached almost at the distal end of the narrow second segment, which is there a little widened; the first joint of great length, sometimes longer than the segment as well as longer than the hand, though these proportions, like others, vary in different specimens; there is a little widening of the joint at the distal end, and as in the female a small apical prolongation of the front margin; the second joint is not broader than long; the third joint is a little longer than the second, with scarcely any free front margin, the hind margin almost semicircular, with a setule here and there; the very small wrist is scarcely distinct from the very narrow base of the hand; the hand very long, nowhere very broad, widening gradually for about half its length, that is, from the base to the beginning of the palm, which is defined by a small projecting tooth carrying a palmar spine and setules; thence the palm margin, fringed with a spine or two and some spinules and setules, but otherwise smooth, runs a little obliquely so as to narrow the hand till it projects in a prominent narrow tooth, followed by a small cavity beyond which a broad tooth or process leads up to the hinge of the finger; the finger is greatly curved, of a length to match the palm, broad, especially where the inner margin swells out with a prominence that bites against the large tooth-process of the palm.

The Branchial Vesicles of the third and fourth segments are very long and narrow, subequal in length to their respective segments.

The Peræopods resemble those of the female in general, but the serrated palmar spines are placed a little lower down, and the front surface of the hand above these presents a more conspicuous set of spinules; the dorsal margin of the finger is set round with a series of cilia or setules, which are perhaps only accidentally absent from the female specimen described.

The following description refers to the female specimen figured on Pl. CXLIV.:—

The lateral lobes of the head scarcely project so far as the frontal process; the suture is deep between the head and the first segment of the peræon, which is about equal in length to the head, and carries almost at the distal end a dorsal tooth, bent very slightly forwards, and, like the other dorsal processes, slightly ciliated; the second segment is longer than the head and first segment united, longer also than the third segment, dorsally carrying a pair of teeth in front of the centre and a single tooth at the distal end, where there is also a small tubercle on either side; the third segment has a rather larger pair of lateral tubercles near the base, and two dorsal tubercles, the larger behind the centre, the smaller at the distal end; the fourth segment is not shorter than the third, and has a couple of dorsal teeth at about the centre and one tooth at the distal end; the fifth segment is a little shorter than the fourth, and has a tubercle on each side not far from the base, a pair of dorsal teeth at the centre, and another pair not far behind these; the lateral borders are distally emarginate for the insertion of the peræopods and are acutely produced both at the upper and lower ends of the emargination; the sixth segment, which like the fifth and seventh is widened distally, is short, subequal in length to the seventh, and, like it, carrying a pair of dorsal tubercles.

Eyes small, situated on the lateral lobes of the head, with numerous very small ocelli.

Upper Antennæ.—The first joint stout, longer than the head; the second joint longer than the first, the third thinner than the second, as long as the first; the flagellum of fourteen joints, of which the first is much the longest, the second the shortest; all have apical setules and all but the last an apical cylindrical filament.

Lower Antennæ.—First two joints short, the gland-cone not produced along the side of the third joint; the third joint about twice as long as broad; the fourth joint as long as the third joint of the upper antennæ, with motor-setæ at about a dozen joints, longer as they approach the distal end; the fifth joint rather thinner and a little longer than the fourth, with similar setæ; the flagellum nearly as long as the fourth joint of the peduncle, the first joint carrying feathered setæ and setules like those on the fourth and fifth joints of the peduncle, and apically a pair of spines, which indeed are like the feathered setæ except in being shorter and slightly thicker; the second joint not quite a third as long as the first, with a similar pair of apical spines amidst numerous apical setules.

Upper Lip distally bilobed a little unsymmetrically, strongly ciliated.

Mandibles.—The cutting plate divided into five or six strong teeth, of which one or two are much more prominent than the rest; the secondary plate on the left mandible similar to the principal, divided into four or five teeth; on the right mandible the edge of this plate seems to be rather denticulate than cut into regular teeth, but this may be an effect produced by wear in the actual specimen examined; spine-row consisting of three serrate spines on the left mandible, of two on the right; the molar tubercle powerful, ciliated, apparently not strongly denticulate, presenting an angular prominence on the side near the spine-row.

Lower Lip.—The principal and inner lobes strongly ciliated; the mandibular processes narrow.

First Maxillæ.—Inner plate wanting; outer plate carrying seven strong spines, of which four are furcate with some serration of the edges, the others are more or less denticulate; the first joint of the palp is short, with a seta at the outer distal angle; the second joint is long, widening distally, and there cut into seven or eight teeth between which are planted six spines, the outermost the longest; on the inner margin and the distal part of one surface there are several setæ.

Second Maxillæ.—The inner plate shorter, but at the base wider, than the outer, fringed with spines of various lengths round the apical margin and about to the centre of the inner; the outer plate with longer spines on the apical margin, and none on the straight inner margin.

Maxillipeds.—The inner plates narrow at the base, not reaching the apex of the first joint of the palp, with numerous feathered setæ on the inner surface between the centre of the inner margin and the centre of the apical; the apical margin broad, irregular, sloping inwards, carrying numerous feathered setæ, and near the outer corner a spine-tooth, together with one or perhaps two such near the inner corner; the outer plates small, just reaching beyond the apex of the first joint of the palp, the inner margin serrate, carrying some setæ and five rather distant spine-teeth; distally there is an emargination which may be reckoned either to the inner or apical margin, carrying two slender spines, the distal one stronger than its neighbour; the first joint of the palp shorter than any of the three following, with setæ on its inner margin; the second joint stoutest near the base, not twice as long as the first, fringed with slender setæ on the inner margin, the third joint almost as long as the second, with numerous long setæ or setiform spines, especially about the inner margin and apex; the finger as long as the third joint, curved, ending in a very sharp point, the inner margin forming a small tooth just in advance of the apex, its whole course finely pectinate, the surface also showing two or three series of little curved markings pectinate on the lower convex side.

First Gnathopods attached close to the maxillipeds. The first joint not longer than the hand, with the front margin straight, the hinder convex, carrying some apical spines; the second joint with some spines a little above the hinder apex; the third joint not

much longer than the second, with slender spines at two or three points of the straight hind margin, and several long ones on the inner surface near both the front margin and widened apex; the wrist rather broader than long, the rounded process behind not produced at all downwards, fringed with spines; the hand much longer than the wrist, narrowing distally, the lower border straight, the whole hind margin occupied by the palm which is finely cut into little bifid and trifid denticles, bordered with setules and defined by a couple of palmar spines; there are several setiform spines about the surface of the hand; the broad curved apically acute finger reaches over the full extent of the palm, the nail passing the palmar spines; the inner margin has a tooth just before reaching the nail, its whole extent being finely though irregularly denticulate, and, the inner part of the finger being channelled, there is a second more strongly denticulate margin.

Second Gnathopods attached near the front of the segment. First joint not so long as the hand, widened a little distally, and with the front apex a little produced; second joint not longer than broad, with a group of spinules above the hinder apex; third joint small, a little longer than broad, with a few small spines about the hind margin; the wrist broader than long, but of quite insignificant dimensions, forming rather a narrow base to the hand than acting as an independent joint; the hand large, twice as long as broad, the long convex front margin carrying a few small distant spines, the setiform spines of the surface not numerous, the hind margin short, oblique; the palm long, convex, fringed with many small spines and spinules, the margin very faintly crenulate, having a small acutely angled prominence not far from the hinge of the finger, while at the other extremity there is a bold tooth followed by a rather deep cavity with palmar spines above and below, between which the acute tip of the long broad slightly curved finger closes down; the inner edge of the finger is sharp and almost smooth; there are small setules on the surface within the inner margin, and there is a small dorsal cilium at some distance from the hinge.

First Peræopods.—Rudimentary side-plates very indistinct, behind the centre of the segment. Branchial vesicles elongate oval, the hinge joint very small. Marsupial plates large, with some short setæ about the front and long ones about the hinder margin.

Second Peræopods.—The diminutive side-plates at the centre of the segment. The branchial vesicles like the preceding pair. The marsupial plates without setæ.

Third Peræopods.—The small plate or joint within which (as seen from the ventral side) the first joint of the limb is socketed, is produced downwards and outwards to an acute apex. The first joint widening distally from a narrow neck, scarcely longer than broad, with some spines at each apex, the outer apex prominent, a little blunted; the second joint short and narrow, with spines at the inner apex; the third joint nearly as long as the first and nearly as broad as long, with some slender spines about the distal margins; the fourth joint as long as the third, but narrower, the spines on the inner

margin more numerous, and at two points of the outer margin; the fifth joint subequal in length to the three preceding together, at a distance from the base of about a fourth of its total length carrying two palmar spines delicately serrate for more than the distal half of their inner margin; below these the joint is abruptly narrowed, and fringed with slender spines; the outer margin has groups of slender spines at five or six points; the finger is strong, curved, matching the palm, with a short dorsal cilium not far from the hinge.

Fourth Peræopods like the third but longer.

Fifth Peræopods like the two preceding pairs, but with all the joints decidedly longer, the third joint much longer than broad, and considerably longer than the fourth joint.

The Pleon appeared to consist of a dorsal plate and a ventral plate, each more or less semi-oval; between these appeared to lie the rounded distal margins of the anal opening, and projecting at either side was a one-jointed uropod.

Length, in the position figured, from the rostrum to the pleon, nearly nine-twentieths of an inch.

Locality.—Station 233A, off Kobé, Japan, May 19, 1875; lat. 34° 38′ N., long. 135° 1′ E.; depth, 50 fathoms; bottom, sand. Four specimens male; two specimens female.

Caprella danilevskii, Czerniavski (Pl. CXLV.).

1868. *Caprella Danilevskii*, Czerniavski, Materialia ad zoograph. pont. compar., p. 92, tab. vi. figs. 21–34.
1880. „ *inermis*, Haswell, Proc. Linn. Soc. N.S.W., vol. iv. p. 348; pl. xxiii. fig. 3.
1882. „ „ Haswell, Catal. Australian Crustacea, p. 314.
1882. „ „ Mayer, Die Caprelliden, p. 71, woodcuts 26–29.
1882. „ *Danilevskii*, Mayer, Die Caprelliden, p. 54.
1885. „ *inermis*, Haswell, Proc. Linn. Soc. N.S.W., vol. ix. pt. iv. p. 8 (separate copy).

Czerniavski gives the following description :—

"*Mas.*—Corpus gracile, aculeis tuberculisve non ornatum, segmento 2-do valde longo, triplum vel quadruplum longiore quam lato, 3-io et 4-to vix brevioribus, 5-to oblongo. Caput segmento 1-mo fere duplo brevius. *Antennæ superiores* $\frac{2}{3}$ corporis breviores, flagello 9–10-articulato, $\frac{2}{3}$ pedunculi breviore, articulis in apice filum olfactorium vel duo quibusque gerentibus, a. 1-mo e duobus composito vel simplici. *Antennæ inferiores* fere pedunculum superiorum longitudine æquantes. *Branchiæ* elongate-elipticæ. *Pedes paris 1-mi* manu pyriformi, palma in angulo subbasali spinam obtusam gerente, ungue curvato, in margine posteriore denticulato; *p.* 2-*di* manu elongatissima, fortissima, quadruplum longiore quam lata, margine anteriore fere recto, palma in dimidio apicali inter duos dentes obtusos rotundinaliter excavata, ungue curvo, margine posteriore in medio incrassato; *p. posteriores 3* breviores, articulis abbreviatis, tarso panlulum curvato, æque lato vel in basi latiore, ungue

crasso, sub apicem curvato. Color rubescente vel viridescente-brunneus. Long. corp. ad $8\frac{1}{2}$ mm.; manus 2-da long ad 1,8 mm.

"*Femina.*—Corpus segmentis 4 primariis permulto minus elongatis, 1-mo dorsaliter breviore, 2-do nec duplo longiore quam lato, 3-io et 4-to paulo longioribus. Caput segmento 1-mo duplo longius. *Pedes 2-di paris* 1-mo minores, manu simili, paulo breviore, sed latiore, palma dente obtuso subbasali, duas spinas subtrorsum gerente, armata, ungue curvato, lævi, 1-mo debiliore. Corpus rubrescente-brunneum, maculis roseis, rariter viridescente-brunneum. Long. usque ad 8,2 mm.

"*Mas junior*, *Pedes* 2-*di paris* 1-mo non majores, manu ad formam feminæ transeunte, ungue lævi."

In the Challenger specimen of the male the dorsal line of the head is as long as the dorsal line of the first segment, though considerably shorter than its ventral line; the third and fourth segments of the peræon are decidedly shorter than the second; the lower antennæ are fully equal in length to the peduncle of the upper; the hand of the second gnathopods is scarcely more than three times as long as the greatest breadth, but neither is it in Czerniavski's figure fully *four* times as long.

In the Challenger specimen of the female the second gnathopods are larger instead of smaller than the first, and have the hind margin (as distinguished from the palm) longer than in Czerniavski's figure, but they well agree with the figure which Czerniavski gives for the second gnathopods of the young male, so that the very unusual circumstance which he attributes to the female, of having the second gnathopods smaller than the first, was probably accidental.

Of *Caprella inermis* the following account is given by Haswell:—"Cephalon terminating anteriorly in a minute mesial tooth. Neck very long; first segment of the body longer than the head and neck, the rest shorter. Superior antennæ as long as the cephalon and first segment of the pereion; flagellum shorter than the last two segments of the peduncle. Inferior antennæ a little longer than the peduncle of the superior pair; flagellum shorter than the two last segments of the peduncle. Anterior gnathopoda short; propodos ovate, palm longitudinal, undefined. Posterior gnathopoda very large; propodos elongated, narrow; palm excavate, uniformly concave, occupying about one-third of the entire length of the propodos. Branchiæ sub-cylindrical. Last pair of pereiopoda longer than the others. Colour green. Length $\frac{7}{10}$ths of an inch. *Hab.* Port Jackson."

This account obviously refers to a male specimen, and agrees so closely with the Challenger specimen of the male as to require no comment, except the remark that the length attributed to the neck or first peræon-segment agrees better with Czerniavski's than with the Challenger specimen. Mr. Haswell in his Revision of the Australian Læmodipoda retains the name *Caprella inermis*, and offers no opinion upon Mayer's suggestion that it may be identical with *Caprella danilevskii*, probably from want of opportunity to consult Czerniavski's work.

On points not mentioned by the preceding authors quoted the following details may be added :—

The animal is in many parts covered with a very short fine down.

Eyes round, small, but with numerous ocelli.

Lower Antennæ having the flagellum armed with motor-setæ, which are shown in the figures given both by Czerniavski and Haswell.

Upper Lip unequally bilobed, the apical part of each lobe furred.

Mandibles.—The cutting plate strongly produced, divided into about five teeth, the actual breadth of the plate not easy to ascertain without breaking the mandible; the secondary plate also rather elongate, apically divided into four teeth, stronger on the left than on the right mandible; the spine-row containing on the left mandible three, on the right mandible two, feathered spines, in each case the one nearer the cutting plates the stouter, the hind one longer, curving backwards; the molar tubercle strong, prominent.

Lower Lip.—The outer lobes a little dehiscent, well ciliated; the inner lobes oval, well developed, strongly ciliated; the mandibular processes divergent, apically narrow.

First Maxillæ.—Inner plate not developed; outer plate carrying on the truncate distal margin seven strongly denticulate spines and some cilia; the first joint of the palp scarcely so long as broad, the second joint long and broad, its apical margin carrying four spine-teeth, of which the outermost is the longest; there are also numerous setiform spines on the surfaces, some of them of considerable length.

Second Maxillæ.—The plates small, the inner shorter than the outer, with slender spines fringing the scarcely rounded apex and descending on the inner margin for a short distance, and there mixing with one or two slightly feathered setæ; the outer plate having the distal margin still more squared, faintly crenulate, and fringed with rather stronger and longer spines, with which short ones are mixed; one or two of the long spines might be regarded as belonging to the inner margin; on the outer margin there are a spinule and some cilia.

Maxillipeds.—Inner plates reaching little beyond the base of the first joint of the palp, narrow at the base, thence widening, the distal margin broad, indentured, sloping inwards, carrying three distant spine-teeth and several feathered spines planted on or a little below the margin; the inner border straight, unarmed; the outer border very convex beyond the neck; the outer plates not reaching the apex of the first joint of the palp, small, the inner margin faintly serrate, fringed with slender setiform slightly feathered spines, at the apex presenting an oblique emargination with a strong spine-tooth at one end and a long spine at the other (the distal end); in the female the inner margin showed two other emarginations below the apical, each with a spine-tooth; in the male there was one additional spine-tooth on one side of the maxillipeds. The broad distal

margin is ciliated; on the outer surface of the plate towards the base there is a row of unequal slender spines; the first joint of the bulky palp is broad, and a little longer than broad; the second is not once and a half as long as the first, broad, the inner margin fringed with slender spines, many of which are very long; the third joint much narrower than the second, but as long, with fringes of long spines on either side the inner margin and at the apex; the fourth joint rather longer than the first, its inner margin finely pectinate, its nail short but extremely sharp.

The first pair of marsupial plates in the female have long setæ on the free margin; the second pair (as seen in the smaller specimen) have setæ also, but these are not long.

Fourth Peræopods a little longer than the third.

Fifth Peræopods much longer than the fourth, the increase of length applying to all the joints, but in a marked manner to the third and fourth, which in the preceding pairs are very short, although in both the third joint is longer than the first. In all three pairs the hind margin of the first joint is produced downwards in a small point; in all three, as Mayer has observed and as Czerniavski's figures show, the hand is devoid of the clasping-spines (Einschlagdorne) so usual in the Caprellidæ; the third pair have some tolerably stout spines a little above the centre of the front margin, and all the pairs have such near its distal end, but all these spines have flexible terminations. The fingers have the inner margin minutely serrulate, and carry some cilia on both margins.

The Uropods appear to be one-jointed, not reaching beyond the trunk of the pleon.

Length of the male specimen, from the front of the head to the end of the pleon, in the position figured, three-tenths of an inch; of one of the female specimens, a little over a quarter of an inch, of the other about a fifth of an inch; the latter one has eggs in the pouch.

Locality.—Bermudas.

Remarks.—The name *Caprella inermis* was preoccupied, so that should this species by any chance prove to be distinct from Czerniavski's, it would fall to Mr. Haswell to select another name for it.

The following Table, adapted from Mayer, Die Caprelliden, p. 17, will illustrate the arrangement of the Caprellidæ here adopted:—

Genus.	Flagellum-joints of Lower Antennæ.	Mandibular-palp.	Peræopods.			Branchial Vesicles to Peræon-segments.	Pleon-segments.	Pairs of Uropods distinguishable.
			1st.	2d.	3d.			
Cercops, . .	2	+	0	0	+	2d 3d 4th	5	3
Proto, . .	More than 2	+	+	+	+	2d 3d 4th	1	2
Dodecas, . .	More than 2	+	+	0	r	2d 3d 4th	1	2
Caprellinopsis, .	More than 2	+	0	0	r	2d 3d 4th	1	2
Caprellinoides, .	More than 2?	+	0	0	r	3d 4th	1	?
Protellopsis, .	2	+	r	r	+	3d 4th	2	2
Protella, . .	2	+	r	r	+	3d 4th	2	♂1 ♀0
Æginella, .	2	+	0	0	+	3d 4th	1	2
Caprella, . .	2	0	0	0	+	3d 4th	1	♂1 ♀0
Podalirius, .	2	0	0	0	r	3d 4th	1	♂1 ♂0

The symbol + means *present*, 0 *absent*, r *rudimentary*.

The name *Podalirius*, having been already used for two genera before its adoption by Krøyer, may be altered to *Pariambus*, from the Greek παρίαμβος, a metrical foot of two short syllables, in allusion to the structure of the third peræopods in this genus.

Tribe III. AMPHIPODA HYPERINA.

Head not coalesced with the first segment of the peræon.

Peræon generally of seven distinct segments; the number not unfrequently reduced by the more or less complete coalescence of the first two, rarely of more than two.

Pleon of five distinct segments severally carrying appendages, the fifth segment[1] being formed by the coalescence of two segments, and with rare exceptions carrying two pairs of appendages, sometimes being itself in coalescence with the telson.

Eyes two, almost always very large,[2] each eye sometimes subdivided into an upper and a lower group of ocelli, with distinct pigment-masses, the upper group sometimes widely separated externally from the lower (*Phronima*, *Phronimella*), at other times contiguous with it (*Platyscelus*, *Thyropus*).

Antennæ, two pairs; the lower pair often obsolete in the female, rarely rudimentary in the male (*Cystisoma*); the upper pair without accessory flagellum.[3]

Maxillipeds, with a single inner plate, and a pair of outer plates, rarely the three plates coalesced (*Paraphronima*); without palps.[4]

The limbs of the *Peræon* of very diversified pattern in different genera, and sometimes in the individual animal; the side-plates generally small; the *Gnathopods* subordinate in size to some or all of the *Peræopods*.

Pleopods generally having on the inner margin of the peduncle two, rarely more than two, small coupling spines, and on the first joint of the inner ramus one, but never more than one, cleft spine, which is very rarely absent (*Cystisoma*, *Dairella*).

From the Amphipoda known as the "Normal Hyperina," a large group has been separated under the title of "Anomalous Hyperina," designated Platyscelidæ by Claus. The two salient peculiarities of this group consist in the generally zigzag-folded lower antennæ of the adult male and the widened first joints of the third and of the fourth peræopods, these laminar joints being more or less adapted to act as opercula. The family of the "Hypérines" was instituted by Milne-Edwards in 1830. For the definition which its author gave of it in 1840, see Note on Milne-Edwards, 1840 (p. 185). For Dana's definition of the equivalent Hyperidea, see Note on Dana, 1852 (p. 256). For a definition of the Hyperina by Claus, see Note on Claus (trans. by Sedgwick), 1884 (p.

[1] Dana sometimes, but with doubtful accuracy, figures the fifth and sixth segments as separate, and of *Dithyrus faba* he says—"the suture between the fifth and sixth is distinct." Bovallius finds these segments separate in some species of *Vibilia*.

[2] In *Lanceola* very small.

[3] *Hyperiopsis*, Sars, is a doubtful exception, since it is not clear that the genus belongs to this group.

[4] The suggestion has been made that the outer plates correspond with the palps of the other two tribes, but that would imply that the joint which elsewhere develops the outer plates was lost in the Hyperina, and there is the further objection that these plates are never in any way palpiform, while their general shape, and to some extent their armature, corresponds with that of the outer plates elsewhere.

553). For a definition of the "Amphipoda Hyperiidea," see Note on Bovallius, 1887 (p. 587); and for notices bearing more or less directly on the definition of the group, see Notes on Claus, 1879 (pp. 487, 490) and 1887 (p. 596).

Family Scinidæ.

Dana in 1852 placed the genus *Clydonia* in a subfamily of the Corophidæ which he constituted to receive it, and named Clydoninæ; Bovallius, having in 1885 established the identity of the genus *Clydonia* with the earlier *Tyro*, in 1887 changed the subfamily into a family, and named it the Tyronidæ; since *Tyro* itself falls to the earlier name *Scinà*, it will be convenient to name the family Scinidæ. The definition given by Bovallius[1] for the family is as follows:—

"Head small. Eyes small as in the Gammarids. First pair of antennæ straight, styliform. Second pair of antennæ angularly bent, fixed at the inferior side of the head. Mandibles without palp. The seventh pair of pereiopoda [fifth peræopods] not transformed. The inner ramus of the uropoda coalesced with the peduncle."

Genus *Scinà*, Prestandrea, 1833.

1833. *Scinà*, Prestandrea, Effemeridi scientifiche e letterarie per la Sicilia, tome vi. p. 10.
1840. „ O. G. Costa and A. Costa, Catalogo de' Crost. del Regno di Napoli.
1840. *Tyro*, Milne-Edwards, Hist. Nat. des Crustacés, tome iii. p. 80.
1849. *Clydonia*, Dana, Amer. Journ. Sci. and Arts, vol. viii. No. 22, p. 140.
1851. *Scina*, Costa, in Hope's Catalogo dei Crostacei Italiani, p. 24.
1852. *Clydonia*, Dana, Proc. Amer. Acad. Arts and Sci., vol. ii.
1852. „ Dana, Amer. Journ. Sci. and Arts, vol xiv. No. 41.
1852. *Tyro*, Dana, Amer. Journ. Sci. and Arts, vol. xiv. No. 41.
1852. *Clydonia*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 831, 834.
1852. *Tyro*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 980.
1862. *Clydonia*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 284.
1862. *Tyro*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 308.
1877. *Clydonia*, Streets, Bulletin U.S. Nat. Mus., No. 7, p. 124.
1882. „ Sars, Oversigt af Norges Crustaceer, pp. 20, 76.
1885. *Tyro*, Bovallius, On some forgotten Genera among Amph. Crust., p. 12.
1886. *Tyro*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 491.
1886. *Clydonia*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 498.
1887. *Tyro*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 3.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 551.

In the Systema Entomologiæ, p. 399, J. C. Fabricius in 1775 defines the Agonata as having "Os palpis quatuor, aut sex. Maxilla inferior nulla." Among these he

[1] Arctic and Antarctic Hyperids, p. 551.

includes the genus *Astacus*, and at p. 415 he gives the following definition of *Astacus crassicornis*:—

"7. A. antennis posticis bifidis, thorace articulato, pedibus sexti paris longissimis.

"Habitat in Oceano americano. *Mus. Banks.*

"Corpus parvum, rubescens. Thorax oblongus, subcylindricus, dorso carinatus, antice retusus absque rostro, articulatus; articulis octo subæqualibus. Antennæ anticæ corpore longiores, setaceæ, crassiusculæ. Abdomen angustatum, quinque-articulatum. Pedes utrinque octo, omnes simplices; sexto duplo longiori, femoreque serrato. Cauda stylis sex exsertis, filiformibus."

By Herbst in 1796 this species is called "Das Dickhorn. Cancer (Gammarellus) *crassicornis*" (see Note on Herbst, p. 61), but, though he correctly places it in the midst of Amphipoda, he leaves it in so much obscurity that later writers have not accepted it as an Amphipod. By the expressions "antennis posticis bifidis," and "pedes utrinque octo," it seems to be entirely excluded from this group, but fortunately there is in the Museum Banksianum, under the care of Dr. Günther in the British Museum at South Kensington, a figure of *Cancer crassicornis*, signed "Sydney Parkinson pinxt. 1768," to which the description by Fabricius clearly refers. The bifid hinder antennæ were perhaps assigned to it as a matter of course on the presumption that the species belonged to the genus *Astacus;* the eight segments attributed to the thorax probably include the head, and possibly the lower antennæ of a male specimen were counted as the first pair of legs, by this means making the total number of legs eight pairs, and the longest pair the sixth in order instead of the fifth; if these or some equivalent explanations be accepted, it will then, I think, be readily admitted that the *Astacus crassicornis* of Fabricius is the earliest described species of the genus since successively named *Scinà, Tyro, Clydonia,* while it is beyond all question that Sydney Parkinson's figure of *Cancer crassicornis* is the earliest known representation of any species of that genus..

The first intelligible description, however, of a species of *Scinà* appears to have been that given by Milne-Edwards in 1830 of *Hyperia cornigera*, which in 1840 he made the type-species of the genus *Tyro.* In the meantime Prestandrea in 1833 had described the genus *Scinà.* For the curiously worded definition, see Note on Prestandrea, 1833 (p. 151). The difficulties introduced into that definition by misprints and bad Latin will disappear on a comparison of it with the specific description which Prestandrea gives of *Scinà ensicorne,* and which for facility of comparison with the other *generic* accounts I here reproduce in English:—

"Body triangular, with the lower surface broader than the lateral, five lines long, dorsally carinate; lateral margins prominent; the colour of the body is deep orange-red, although in the middle there are one or two segments whitish. Head truncate, depressed, with two raised divergent lines, which starting from the beginning of the carina, where they form an acute angle, terminate at the base of the upper antennæ. Upper antennæ

sword-shaped, triangular as far as the half of their length, with the lower angle denticulate at the base, three and a half lines long, flesh-coloured with two lines of orange-red dots; they are supported on a short cylindrical peduncle. Lower antennæ filiform, white, much longer than the upper, formed of six joints, the first of which is much longer than the rest. Eyes very small, round, orange-red, placed on the outer side at the base of the upper antennæ. Thorax of seven segments, which increase gradually in width to the fifth; the sixth and seventh are narrower. Abdomen of four rings, narrower, but longer than those of the thorax, so that the whole of the animal appears as if divided into two portions, the anterior half wider, the hinder abruptly narrowed. Seven pairs of legs properly so called, simple, slender, which in their length preserve the order of the segments of the thorax;[1] the fifth pair, the longest of all, is denticulate on the outer side through the whole length of the second joint, which on the inner side is prolonged beyond the articulation in an acute point. The tail carries six very slender stiles; four inserted on the same line, and the other two lateral, somewhat lower and longer than these."

It is possible that the notes of colouring[2] given by Prestandrea may suffice to determine whether his species be the same as *Tyro marginata*, Bovallius, which is also from the Mediterranean, but in the latter species the eyes are said to be very large. *Tyro cornigera*, Milne-Edwards, agrees with Prestandrea's species in having "face supérieure de la tête garnie de deux petites crêtes obtuses et divergentes."

For the original definition of the genus *Tyro*, see Note on Milne-Edwards, 1840 (p. 189). It will be noticed that Milne-Edwards says that "the lower antennæ are extremely small," while Prestandrea says that they are much longer than the upper, but the apparent discrepancy can be explained by a reference to the description of *Clydonia borealis*, in which Sars states that "the lower antennæ of the female are altogether rudimentary, almost inconspicuous, those of the male elongate, very thin, filiform, geniculate." For the definition of the genus *Clydonia*, see Note on Dana, 1849 (p. 229). The identity of this genus with *Tyro*, Milne-Edwards, was pointed out by Bovallius in 1885, but Bovallius does not describe the lower antennæ in any of the nine species which he refers to this genus. It is therefore probably from the male of *Clydonia borealis*, as described and figured by Sars, that, in the diagnosis of the family Tyronidæ, he draws the character of the lower antennæ as "angularly bent, fixed at the inferior side of the head." The definition which Bovallius gives of the genus is as follows:—

"Head truncated anteriorly. First pair of antennæ very robust, long, occupying with their basal joints the largest part of the anterior side of the head. First two pairs of pereiopoda [first and second gnathopods] simple, not cheliform. Fifth pair [third

[1] The meaning no doubt is that the shorter legs are attached to the shorter segments and the longer legs to the longer segments, but at any rate in some of the species, if not in all, the fourth segment is longer than the fifth, while the limbs of the fifth are longer than those of the fourth, and in *Tyro clausii*, Bovallius, the short sixth segment has the limbs longer than those of the longer fifth segment.

[2] The colouring of an unpublished figure by Sir J. D. Hooker agrees well with that of Prestandrea's species.

peræopods] strongly developed. Inner rami of the uropoda coalesced with the peduncles. Peduncles very long and broad."

To this may be added the seemingly unique character, that the first maxillæ have the outer plate apically divided.

Scinà cornigera (Milne-Edwards) (Pl. CXLVI.).

1830. *Hyperia cornigera*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 387 (extr., p. 36).
1840. *Tyro cornigera*, Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 80.
1850–52. *Clydonia gracilis*, Dana, Proc. Amer. Acad. Arts and Sci., vol. ii. p. 219.
1852. „ „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 834, pl. lv. fig. 6, *a*, *b*.
1862. „ „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 284, pl. xlvii. fig. 8.
1862. *Tyro cornigera*, Spence-Bate, Brit. Mus. Catal. Amph. Crust., p. 308.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 3.
1887. „ *gracilis*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 4.

The specimens belonging to this genus were all hard and more or less shrivelled, as though by some accident they had become dry before being put into spirit. Hence some of the details have been made obscure or doubtful. There seems to be a minute rostrum; the back of the peræon is rounded and probably also that of the pleon, but, if appearances may be trusted, the centre of the back is angled throughout except at the head and telson; of the pleon-segments the first two appear to have the postero-lateral angles but little rounded, while in the third these angles seem to be more strongly rounded; the fifth and sixth segments are completely coalesced, except that the fifth is sufficiently wider than the sixth to admit the attachment of a uropod on either side to the projecting hind margin; the following uropods occupy the whole hind margin of the sixth segment.

The Eyes are small, situate on the sides of the head, composed of nine ocelli.

Upper Antennæ very large, a little less than two and a half times as long as the elongate first uropods; the peduncle consists of one thick cylindrical joint, nearly as broad as long; the flagellum, at its base nearly as broad as the peduncle, tapers gradually to the distant apex; in section it is almost prismatic, the two lateral edges and the lower one being all armed with little spine-like teeth; on the inner margin at the proximal end there are some cilia or thread-like spines; at the distal end there is a faint show of division into three or four joints, but in the condition of the specimens this cannot be spoken of with any certainty, being probably only due to cracking or shrivelling. In the male, fig. *a.s.* A., the proximal half of the flagellum joint has a tolerably strong brush of filaments.

Lower Antennæ in the female very small and slender, placed close behind the upper, the base being a broad joint more or less adherent to the wall of the head, accompanied by a tolerably conspicuous gland-cone; the next joint is small, cylindrical, a little longer

than wide, and is followed by a terminal joint much narrower but immensely longer, tapering so far as its initial narrowness permits, which may be regarded as the flagellum; how diminutive are these lower antennæ compared with the upper, may be judged from the figures of both in the Plate, which are drawn to the same scale. In the male it is probable that here, as in *Scinà borealis* (Sars), the lower antennæ attain a much greater development; successive steps are seen in the figures *a.i.* B., *a.i.* C., and *a.i.* A., from three different specimens; the coalesced first and second joints of the peduncle are to some extent free from the wall of the head and show a small blunt gland-cone; the third joint is rather longer than broad; the fourth longer than the third; the fifth longer than the preceding two together, more or less bent except in the earliest stage; the first joint of the flagellum at first shorter than the last of the peduncle, then equal to it, and eventually perhaps exceeding it in length; this is succeeded in the different specimens by three, four, and five joints respectively. In fig. *a.i.* C., these antennæ are shown in their position as folded back round the mouth organs. The flagellum-joints of specimen A were seen to be microscopically scabrous near the convex margin, with little groups of spinules.

Upper Lip unequally bilobed.

Mandibles without palp, spine-row, or molar tubercle; the trunk shallow, attached along the straight upper border, the front terminating in a small cutting edge, which is more or less triangular, striated in appearance, and minutely denticulate; the secondary plate of the left mandible is similar to the principal plate, but rather smaller, the denticles fewer, about fourteen in number.

First Maxillæ.—The inner plate appears to be rather broadly oval, distally hairy; the outer plate slender, a little curved, its outer margin convex, at some distance from the apex interrupted and capped by a spine, the remainder of the plate being triangular, with smooth outer margin, the inner carrying three denticles and a spine, the narrow apex completely occupied by a spine; the concave inner margin ends in a similar but smaller triangular piece, with some minute denticles on either side and an apical spine; this plate therefore presents the very unusual feature of a cleft termination, and in some positions the spine on the outer margin together with the two terminal triangles gives it a tridentate appearance;[1] the palp, consisting of a single joint, is broader and a little longer than the outer plate, its outer margin a little convex, the inner a little concave, with some spinules adjacent, the distal margin nearly straight, with a spinule near the outer apex, and a little tooth at the inner apex. The figure of these maxillæ is taken from the South Atlantic specimen, in which the principal apex of the outer plate shows five denticles.

Second Maxillæ.—The inner plate shorter and much narrower than the outer, distally furred with numerous spines of various thicknesses but none large, the distal margin narrow but truncate and having a blunt tooth on the inner corner; the outer plate rather broad, but not long, somewhat bent, furred with rather stronger spines than

[1] In *Clydonia borealis* G. O. Sars describes this plate as "angusto, incurvato, indistincte tridentato."

those of the inner plate, the distal margin truncate and having a blunt tooth at each end, each tooth having beside it a comparatively long spine.

Maxillipeds.—The inner plate is very much narrower and shorter than the outer; the outer plates have the straight inner edges scarcely at all dehiscent, the adjacent ridge of the inner surface armed with a few small spinules, the outer edge convex, very lightly furred; the distal half in these plates is much narrower than the proximal, each ending in a narrowly rounded apex.

First Gnathopods.—The side-plates shallow, broader than deep. The first joint almost entirely free from the side-plate, evenly broad throughout except at the extremities, with one or two setules near the apex behind; the second joint short, the surface speckled with tiny spicules, the hinder apex having some small curved spines; the third joint, very little longer than the second, with a pointed apex lying against the wrist, the hinder surface furred with spicules; the wrist not so long or so broad as the first joint, but broader and much longer than the hand, widening a little distally, the hind margin fringed with very slender spines, of which there are some also along the surface and at the front apex; the hand narrow, without palm, having the front margin gently convex, the hinder nearly straight, scabrous, both fringed with slender spines, those on and adjoining the hind margin more numerous than those in front, the surface also carrying many groups of spines; a slender, nearly straight finger, slightly pectinate on the inner margin, is attached between the two front slightly produced and rounded apices, and in length about equals half the hand.

Second Gnathopods.—Side-plates a little broader than the preceding pair. Branchial vesicles seemingly about as long as the first joint, widening below. The limb similar in general character to the preceding, the first joint a little longer, with a few setules on the hind margin; the second and third a little thinner and less scabrous, with slender spines near the hinder apex, the wrist shorter and with fewer spines, the hand longer so as to be nearly as long as the wrist, also with fewer spines and a somewhat less breadth; the finger not quite half the length of the hand.

First Peræopods.—The side-plates shallow. The first joint as in the preceding pairs; the second joint considerably longer than broad, widening from a narrow neck; the third joint a little shorter than the fourth, a little longer than the fifth; the fourth as broad as the third, but much broader than the fifth; the fifth narrow, broadest near the base; the finger very slender, slightly curved, not quite half the length of the fifth joint; the armature of the limb very slight, the hind margin of the third, fourth, and fifth joints, and of the finger at its upper half, being faintly pectinate.

Second Peræopods scarcely differing from the first, but having the third and fourth joints a little longer.

Third Peræopods.—The side-plates rather deeper than the preceding pair, narrowly produced both before and behind and carinate. The first joint of great

length, of prismatic section like the upper antennæ, its three sharp edges serrate, the hinder one forming the strongest teeth; the front margin is produced into a thin pointed process, which in most of the specimens is broken or crumpled; the second joint is very small, serving as a hinge between the somewhat expanded end of the first joint and the base of the third which folds back closely against it; the third joint is rather shorter than the fourth; these two together reach back beyond the first joint when folded against it, but the first joint including its distal process almost equals or occasionally exceeds their united length; the fifth joint is slender, and no doubt owing to its feeble structure, the great length of the limb, and the prominent position which it appears to assume, this joint is in many instances damaged; its length is less than half that of the fourth joint, its front margin being like that of the third and fourth joints very faintly serrulate; the finger curved, minute, with bulbous base, apically slender.

Fourth Peræopods.—The first joint longer than in the first and second peræopods, which this pair in many respects resembles; the second joint small, but larger than in the third pair; the third joint longer than the fourth; the fourth a little longer than the fifth; the fifth a little narrower than the fourth, but wider than the corresponding joint in the first and second peræopods.

Fifth Peræopods slender; the first joint shorter than in the preceding pair, widest near the base; the second small, a little longer than broad; the third longer than the fourth or fifth; the fourth a good deal shorter and a little wider than the fifth; the finger very slender, curved, not half the length of the fifth joint.

Pleopods.—The coupling-spines short, with two rows of retroverted teeth and a bent apex; the cleft spine is short, the arm with the backward serratures being scarcely, if at all, longer than that with the subapical dilatation; the joints of the inner ramus number from seven to nine, of the outer from nine to eleven, the inner ramus being rather the shorter.

Uropods.—The first pair reach beyond the second and as far as the apices of the first or nearly so; on the straight inner margin they have some small distant teeth, on the more convex outer margin the dentation is coarser and continuous, especially along the lower half till near the acute apex; an interruption near the middle of the outer margin is occupied by a spine-like rudiment of an outer ramus; the second pair reach beyond the outer ramus of the third pair, the straight inner margin for most of its length ornamented with little teeth at intervals, the spaces between being filled with a succession of much smaller teeth of great slenderness; the outer margin is interrupted near the middle, about on a level with the interruption in the first pair, and there carries a similar spine-like rudiment of an outer ramus, which may be regarded as marking the commencement of the coalesced inner ramus; the third pair at about the middle has a free outer ramus, reaching about halfway to the end, and having its inner margin finely toothed; the outer margin of the coalesced ramus is more coarsely toothed.

The Telson is minute, triangular, nearly once and a half as long as broad.

Length, without the antennæ, two-fifths of an inch.

Locality.—The label "September 29, 1873," refers this species to the South Atlantic, off the coast of Brazil, lat. 19° 6′ S., long. 35° 40′ W. Six specimens, two of them males.

"October 5, 1873, South Atlantic, surface, night;" between lat. 26° 15′ and 29° 35′ S., long. 32° 56′ and 28° 9′ W. One specimen, male.

A specimen labelled "New Hebrides, August 23, 1874," does not seem distinguishable from this species, although coming from a very distant locality, between lat. 15° 58′ and 14° 7′ S., long. 160° 48′ and 153° 43′ E. It has, however, a shorter wrist to the first gnathopods, and the outer ramus of the third uropods is more than half the length of the inner ramus.

Remarks.—Whether this be really Milne-Edwards' briefly described species from the Atlantic must perhaps remain a little uncertain. He describes the upper antennæ as longer than the body, but whether by this he means the peræon and pleon without the head and the uropods is not clear. "*Tyro Sarsii*" of Bovallius is very near to, if not identical with, the present species, but there seems to be little to separate that species from *Tyro cornigera*. Dana's *Clydonia gracilis* agrees with the present species in so minute a particular as having "eyes small, nine lenses"; the description of *Astacus crassicornis*, Fabricius, is too vague and erroneous to entitle the specific name to the honour of priority.

Family Vibilidæ, Claus, 1872.

In 1840 Milne-Edwards formed the "Tribu des Hypérines gammaroides," to receive the single genus *Vibilia*. In 1852, Dana placed this tribe in the family Hyperidæ, as "Subfam. 1. Vibilinæ." Claus changed the subfamily into the family Vibilidæ. This is changed into Vibiliidæ by Carus in 1885, but written Vibilidæ by Gerstaecker in 1886, and by Bovallius in 1887. None of these writers increase the number of genera in the family. In the table of generic divisions belonging to his "Famille des Hypérines," Milne-Edwards, in 1830, attributes to *Vibilia*, "pattes-mâchoires présentant des rudimens de tiges palpiformes." These he figures in his later work, pl. xxx. fig. 2. Dana in 1852, and Carus in 1885, retain these rudimentary palps of the maxillipeds as a character of the group, but it is almost certain that the original mention of them was due to some error of observation; Marion in 1874 expressly denies their existence either in adult or young of *Vibilia jeangerardii*, Lucas. Bovallius in 1887 gives the following character of the family:—

"Head small, not tumid; eyes mediocre, resembling those in the Gammarids. Both pairs of antennæ fixed at the anterior side of the head. First pair with the first joint

of flagellum very large, compressed; the rest of flagellum minute. Second pair filiform, angulated. Mandibles with palp. Dactyli of seventh pair of pereiopoda [fifth peræopods] transformed [not normal]."

Genus *Vibilia*, Milne-Edwards, 1830.

1830. *Vibilia*, Milne-Edwards, Ann. d. Sci. Nat., tom. xx. p. 386 (pp. 34, 35, extr.).
1831. *Dactylocera* (*pars*), Latreille, Cours d'Entomologie, p. 398.
1836. *Thaumalea*, Templeton, Trans. Entom. Soc. Lond., vol. i. pt. iii.
1837. *Vibilia*, Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ Lucas, Hist. Nat. des Crust. Arachn. et Myriap., p. 233.
1840. „ Milne-Edwards, Hist. Nat. des Crust., p. 72.
1849. „ Lucas, Explor. Scient. de l'Algérie, Zool., p. 56.
1850. *Orattrina*, de Natale, Su pochi Crost. del porto di Messina (See Appendix).
1851. *Elasmocerus* (*?*),[1] Costa, Hope's Catalogo dei Crost. Italiani, p. 22.
1852. *Vibilia*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 980.
1853. „ Costa, Rend. della Soc. r. Borb.
1857. „ Costa, Ricerche sui Crost. Amf. del regno di Napoli, p. 233.
1858–74. „ Chenu and Desmarest, L'Encycl. d'Hist. Nat. Crust., p. 48.
1861. „ Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. viii. p. 1.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 299.
1868. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 524.
1872. „ Claus, Grundzüge der Zoologie, ed. 2, p. 467 (Marion).
1874. „ Marion, Ann. d. Sci. Nat., ser. 6, Zool., t. i. p. 4.
1878. „ Claus, Zool. Anzeiger, Jahrgang i. No. 12, p. 269.
1880. „ Claus, Grundzüge der Zoologie, Auflage 4, Bd. i.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 421.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 492.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 6.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exp., Bd. iv. p. 554.

For the original definition of the genus, see Note on Milne-Edwards, 1830 (p. 142). The account of *Dactylocera* given by Latreille in 1831 (see p. 144) is of no importance. For *Thaumalea*, see the description of the species *Thaumalea depilis*, in Note on Templeton, 1836 (p. 167). Bovallius in 1887, gives the following definition of *Vibilia*:—

"Head small, almost quadrangular. Eyes small, ovate or bean-shaped. First pair of pereiopoda [gnathopods] simple, not chelate, second pair with a more or less produced carpal process. Femur of seventh pair [first joint of fifth peræopods] shorter [than] or as long as the following joints together. Telson broad, well developed."

[1] Costa does not describe the genus, but since its name means—with expanded antennæ—and since Costa subsequently named a species *Vibilia speciosa*, and does not again mention *Elasmocerus*, it may be presumed that he had discovered that his *Elasmocerus speciosus* was a *Vibilia*.

In regard to the eyes it may be noticed that Bovallius attributes to the species *Vibilia gracilenta* "eyes large," and to the species *Vibilia macropis* "eyes very large, occupying almost the whole sides of the head." The gnathopods and the first four pairs of peræopods in this genus have the first joint arranged for containing gland-cells. Many of the species, according to Bovallius, have the fifth and sixth segments of the pleon free, not coalesced.

Vibilia propinqua, n. sp. (Pl. CXLVII.).

Back round, smooth; rostrum minute, sharp; first segment of the peræon very short, with the front corners a little projecting forwards; the postero-lateral corners of the first three segments of the pleon rounded, very finely serrate; the fifth and sixth segments of the pleon completely coalesced dorsally, but less completely ventrally.

Eyes long oval, vertical, narrowing below, wide apart; the ocelli small, numerous.

Upper Antennæ.—Peduncle very short; the first joint broader than long, on the inner side overlapping the other two, which are very short; the flagellum longer than the peduncle, its broad flat joint scarcely narrowing till near the apex, where it is still broad; the length about twice the breadth; along the centre of the inner surface are two rows of filaments, in numerous small groups, not reaching to the apex, and round the edge spinules are placed at regular intervals, the lower margin distally more or less oblique, its tip concealing two minute joints.

Lower Antennæ inserted in a small notch of the head, very much narrower than the upper and but little longer, with six free joints, the first about as long as broad, the second not twice as long as the first, the third slightly longer than the second, the fourth slightly longer than the third, the fifth equal to the first, the sixth nearly twice as long as the fifth; of these the first three are no doubt homologous with the third, fourth, and fifth joints in the Gammarina, the first two joints of the peduncle being here obscured by coalescence with the head, the opening of the gland-cone being at some distance from the first free joint; the last three joints, constituting the flagellum, are armed with spinules on the upper margin and taper to an almost acute apex, near which the spinules are close set.

Upper Lip.—Epistome broader than deep; the distal border of the lip with a deep but narrow emargination, from which two narrow rounded not quite symmetrical lobes result, the cilia on the sides of the emargination overlapping; the inner plate has a broad nearly straight edge, furred with short cilia.

Mandibles.—Cutting edge a little convex, with about fourteen little teeth; the secondary plate of the left mandible triangular, the distal edge cut into about a dozen small denticles, resembling those of the principal plate; the secondary plate of the right mandible narrow, strap-shaped, apically divided into a very few teeth; in the spine-row

the first two spines are furcate or tridentate, and though not longer are stronger and more horny-looking than the rest, which include four of moderate length and two or three that are very short; there is also a group of almost hair-like spines; the molar tubercle is strong, with numerous sharp teeth round the oval crown; the long palp has the first joint longer than broad, a little widened distally, the second joint narrower but much longer, much curved, the front margin convex, the hinder very concave; the third joint thinner and longer than the second, curving in the opposite direction, at first narrowing and then widening again slightly, its concave front margin almost smooth, the convex hinder margin furred, except near the base, with many small spines; the apex forming an acute point.

Lower Lip.—The outer corner of the distal margin of the principal lobes prolonged into a tooth, the slightly convex distal and outer margins on either side of this tooth fringed with cilia; the mandibular processes as usual in this genus with the ends scarcely free.

First Maxillæ.—Inner plate small, oval; outer plate with numerous slender spines on the distal part, the distal margin not very broad, with (not fewer than) eight stout spines, of which the outermost are the longest, some having lateral denticles, the outermost but one the strongest, but without denticles; the palp consists of a single joint, narrower than the base on which it stands, reaching a little beyond the outer plate, having long slender spines on its margins, and on the narrow apex a group of unequal spines rather stouter than the rest.

Second Maxillæ short. The basal part with very convex outer margin, the inner plate much narrower than the outer, curved, apically narrowed, with spines along the distal part of the outer margin and at the apex, besides many hair-like spines in other parts; the outer plate short and broad, the outer margin carrying many hair-like spines, except at the base, apically produced into a rounded point, which is tipped and flanked with many spines; the inner margin and inner part of the distal margin are united by a curve and appear to be smooth.

Maxillipeds.—The inner plate, of which the length and breadth are about equal, has a convex distal margin divided into five flat-topped teeth in the centre, the three central scarcely distinct from one another; the flat teeth are followed on either side by five sharp denticles, the first two forming a single tooth, the other three separate; the inner surface shows five spinules down the centre, not symmetrically arranged, and a great many scattered cilia; the outer plates are much longer than broad, with three or four spinules not symmetrically arranged on the convex outer margins; the inner margins dehiscent till near the convex distal part, irregularly cut into several sharp teeth, with one small spine or sometimes two inserted at the base of the tooth, but not quite reaching its apex; on the convex distal part the teeth and spines are small and crowded together; seven or eight denticles overlap one another on the apical part of the

outer margin; the inner surface has many cilia or hair-like spines near the inner margin, and the outer surface carries a curved row of about a dozen small spines at some distance from the inner margin.

First Gnathopods.—Side-plates small, broader than deep, with rounded front. The first joint long and broad compared with the rest of the limb, the margins smooth, the hinder more evenly convex than the front which bulges a little above the centre, the distal margin carrying two or three small spines; the second joint not longer than broad, with some spines near the apex of the hind margin; the third joint very little longer than the second, almost triangular, with a strong spine at the apex of the hind margin and a smaller one above; the wrist a little longer and wider than the hand, the hind margin nearly straight, with a spine at the apex and a smaller one near it above, the front margin with a group of small spines at the apex, the distal margin sinuous, minutely pectinate; the hand widening a little from the base, then narrowing to the apex, with three spines on the distal half of the very convex front margin, the hind margin nearly straight, pectinate for most of its length with little teeth; the finger narrow, curved, acute, a little more than half the length of the hand, the proximal half of the inner margin pectinate. Almost all or all the spines are more or less feathered or denticulate.

Second Gnathopods.—The side-plates much broader than deep, the front rounded. The branchial vesicles very large, much longer and broader than the first joint, narrowing to a rounded tip; the marsupial plates nearly as long as the first joint, rounded oval, very broad, finely scabrous. The first two joints similar to those of the first gnathopods, but rather larger, the second with two spines on the hind margin; the third joint longer than the hand, overlapping a large part of the wrist on the inner side, the hind margin carrying eight spines, those at the distal part the longest, feathered; the distal margin truncate, armed with five or six stout spines that have hooked tips, and are more or less denticulate; the wrist is broader than the hand, and longer even without the narrow acute process by which it overlaps more than half the hand's hinder margin; the front margin has an apical spine; the process is denticulate on one of its inner edges and finely pectinate on the other, the two edges not being in view together; the hand and finger are as in the first gnathopods, except that the hand is scarcely so broad, the spines of its front margin are more slender, and the finger is not more than half the length of the hand.

First Peræopods.—Side-plates rather broader than deep, like the two preceding pairs narrower in front than behind, the front margin flatter. The branchial vesicles and marsupial plates large. The first joint with sinuous front margin, convex above, concave below, the hind margin convex, except at the base; the second joint short; the third longer and broader than the fourth; the fourth with a straight hind margin, the front convex, the distal margin of the inner surface pectinate; the fifth joint narrower than the

fourth, about as long as the third, curved, pectinate, but not closely, on the concave hind margin, the adjacent surface scabrous with little spines; the finger narrow, curved near the base, where on the inner margin it has a trace of incipient pectination, the length not half that of the hand. There are some minute distant spinules on various parts of the limb.

Second Peræopods.—The side-plates deeper than the preceding pair. The branchial vesicles and the limb similar to those of the first peræopods, but with the third, fourth, and fifth joints of the limb longer. Both the first and second pairs of peræopods are very considerably larger than the gnathopods.

Third Peræopods.—The side-plates with a front lobe much broader than deep, and a narrow hind lobe descending below the front one; hexagonal markings are conspicuous on these plates. The branchial vesicles broad, irregular in shape; the marsupial plates large. The first joint narrow at the base and nowhere much expanded, two or three times as long as broad, the margins nearly parallel, the front one with four spines at the distal part; the second joint short; the third joint longer than the fourth, shorter than the fifth, rather narrower than the third joint of the preceding pair; the fourth joint has a small spine at the pectinate distal end, besides having like the two preceding joints some minute spinules here and there; the fifth joint is slightly curved and has the concave front margin closely pectinate; this and the preceding joint exceed in length the corresponding joints both of the second and those of the fourth peræopods; the finger about a third of the length of the fifth joint.

Fourth Peræopods.—The side-plates about equally broad and deep, the hind lobe deeper than the front one. The branchial vesicles smaller than the preceding, but otherwise very similar. The first joint wider and longer than in the preceding pair, with five spines on the lower part of the front margin; the third joint rather shorter than in the third pair, with two spines at the distal end of the front margin; the fourth joint with the front margin pectinate except at the base, and carrying six spines at intervals, the apical margin also pectinate; the fifth joint armed as in the preceding pair; the finger similar.

Fifth Peræopods very considerably shorter than the fourth, yet much more than half the length. The side-plates rounded behind, and there free only for a short space from the segment's upper part. The first joint expanded, somewhat oblong, the front margin not very convex, a little scabrous below, the hind margin very slightly convex, completely overlapping the short second joint with a narrow rounded lobe; the third joint bent forward at the base, the proximal part of the hind margin being convex, the rest straight, having a small spine near the apex, and having like the other joints some pectination of the distal margin; the front margin nearly straight, with a small apical spine; the fourth joint longer than the third, slightly curved; the fifth joint narrower but rather longer than the fourth, also slightly bent; the finger not acute, shorter than

the fifth or the fourth joint, the apical part slightly widened and spoon-shaped, edged with spines, and having on the surface near the front margin a row of spines with their points directed upwards, the surface being also set with lines of spinules in little curved groups, which are found also near the front margins of the two preceding joints.

Pleopods.—The peduncles broad, not so long as the rami; the two coupling spines very short, apically broad and bent, with two or three retroverted teeth; the cleft spine stout, with slender unequal arms, each having a very slight subapical dilatation; the joints of the rami broad, numbering from eleven to fourteen, the inner ramus the broader, its joints generally one less in number than those of the outer ramus.

Uropods.—The peduncles of the first pair longer than the rami, and reaching beyond those of the second pair, the outer margin cut into small teeth; the rami almost equal, the outer slightly the shorter, both margins cut into teeth, those on the inner side the larger, the apex acute; the inner ramus with the outer margin cut into teeth, the lower half of the outer into four or five distant teeth, the apex acute; the peduncles of the second pair a little longer than the rami; the inner ramus the longer, armed like that of the first pair, the outer ramus having its inner margin cut into teeth, and the lower half of the outer; the peduncles of the third pair broad, longer than the rami, reaching much beyond the first peduncles, the edges smooth, the inner converging to near the apex of the telson, and then running near together with a slight convexity; the inner ramus rather broader and longer than the outer, its outer margin and lower part of the inner finely pectinate; the outer ramus with the inner margin and lower part of the outer pectinate; the apices acute.

The Telson shortly pear-shaped, about as broad as long, rather more than half the length of the peduncles of the third uropods, the narrow apex rounded.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the back of the second segment of the pleon, just over one-fifth of an inch.

Locality.—"April 4, 1875; Pacific Ocean, off Volcano Island; surface." Lat. 25° 30′ N., long. 138° 0′ E. Four specimens were obtained, that from which the details are drawn being of the same size as that of which the full figure is given.

Remarks.—The specific name refers to the evident proximity of this species to *Vibilia peronii*, Milne-Edwards, and *Vibilia robusta*, Bovallius. The notices hitherto published of those two species, both of them found in eastern waters, do not seem to me to suffice to discriminate them the one from the other. The present species is distinguished from both by having the fifth and sixth segments of the pleon coalesced, not free. The rami of the second and third uropods also are unequal, not equal as in *Vibilia robusta*.

Vibilia milnei, n. sp. (Pl. CXLVIIIA.).

This species does not differ greatly in general appearance and structure from *Vibilia propinqua*. The points of difference displayed by the specimen will be described, it being understood that no specific value can be attached to the characters of the lower antennæ and the mandibular palp, since they vary with the age of the animal.

Upper Antennæ.—The large flagellum joint oval, with almost entirely smooth margins, the upper more flattened than the lower; at the rounded apex the two minute terminal joints rest upon the surface, the apical much the smaller and just projecting.

Lower Antennæ about as long as the flagellum joint of the upper, but much narrower. The first free joint short, the second longer, the third intermediate; the single flagellum joint tapering, nearly as long as the three preceding together, tipped with a spinule.

Mandibles.—The secondary plate of the right mandible distally divided into three irregular teeth; the molar tubercle very prominent; the third joint of the palp not very slender, the apex abruptly acute.

Maxillipeds.—The inner margin of the outer plates nearly straight, with only a single small spine to each denticle; the upper part of the outer margin carrying a single spinule.

First Gnathopods.—The first joint without spines, the second and third joints each with one spine; the wrist not longer than the hand; the hand with a single spine within the convex front margin, the hind margin irregularly pectinate, with few teeth; the finger not more than half the length of the hand, slightly pectinate.

Second Gnathopods.—The third joint has five spines on the hind margin, and four on the distal margin, these being straight, not hooked, at the tips; the process of the wrist is very acute, its margin facing the hand not strongly pectinate; the hand not closely pectinate, carrying some little spinules dispersed over the breast.

The first four pairs of peræopods are of shorter, stouter build than in *Vibilia propinqua*, and in the fourth pair the fifth joint is longer instead of shorter than the corresponding joint of the third pair; the front margin of the fourth joint of the fourth peræopods has four spines.

Fifth Peræopods little more than half the length of the preceding pair. The first joint broadly oval, not very much longer than broad, widening at once from a narrow neck, the hind margin rather more convex and shorter than the front, not produced at the back of the short second joint, which is bent up close to it; the third joint longer than the second, little longer than broad; the fourth slightly longer and slightly narrower than the third; the fifth a little longer and a good deal narrower than the fourth; the sixth almost as long as the fifth, a little narrower, round-ended, with some minute armature round the margin, the other joints being quite smooth or with armature requiring a very high microscopic power for its discernment.

Pleopods.—The joints of the rami numbering from ten to eleven.

The Telson small, nearly circular, but flattened at the base.

Length.—The specimen, with the after part of the pleon flexed, measured a fifth of an inch.

Locality.—The single specimen, a male, was taken at the surface in the South Atlantic, on the night of October 5, 1873.

Remarks.—The specific name is taken from the first part of the name of the distinguished French naturalist, the second part of his name having been applied to another species in this genus. The species differs from *Vibilia macropis*, Bovallius, which is also from the South Atlantic, by the smaller size of the eyes, by the flagellum of the upper antennæ not being "elongate lanceolate," and by the rami of the uropoda being much serrate, and in the second and third pairs not equal. It has a shorter telson than *Vibilia gracilis*, Bovallius, from the Pacific, though it agrees with that species in having a round telson and in some other noticeable characters.

Vibilia sp. (Pl. CXLVIIIB. figs. C, D).

Rostrum minute, back smoothly rounded.

Eyes oval, the lower end the smaller.

Upper Antennæ.—The distal end of the large flagellum joint a little narrowed.

Lower Antennæ.—Two stages of the development of the flagellum are shown in the figures *a.i.* C. and *a.i.* D. respectively.

Mouth Organs differing little from those of *Vibilia propinqua.* In the molar tubercle of the mandible the teeth along the flattened side of the crown were here observed to be long and slender, and apically bidentate or tridentate.

First Gnathopods nearly as in *Vibilia propinqua*, but the wrist scarcely so long as the hand, and with only one spine on the apex of the hind margin.

Second Gnathopods.—The third joint has seven spines on the hind margin, six on the apical margin, all with sharp tips, the front spine much the smallest.

Peræopods like those of *Vibilia propinqua.* In the fourth pair the fourth joint has seven spines on the front margin, and in the fifth pair the first joint is rather more widely expanded than in the species compared.

Uropods.—In one specimen the inner ramus of the third pair was considerably longer than the outer ramus, see fig. *ur.*3. C., but in another specimen the difference was less.

Length, from the front of the head to the back of the second segment of the pleon, three-tenths of an inch.

Locality.—"March 10, 1876, South Atlantic, surface." Lat. 37° 29′ S., long. 27° 31′ W. Six specimens.

Remarks.—It seems probable that this form may be one of the numerous species from the Atlantic which have already received names, otherwise the differences scarcely suffice to separate it from the eastern species, *Vibilia propinqua.*

Vibilia viator, n. sp. (Pl. CXLVIIIB. fig. E).

The dorsal depression deep where the fifth and sixth segments of the pleon coalesce, but with no separation between them.

Eyes large and dark.

Upper Antennæ with the upper margin of the large flagellum joint much longer than the lower, the end of the joint being obliquely truncate.

Lower Antennæ.—The flagellum in this specimen exhibiting six joints.

Upper Lip.—The smaller of the distal lobes distinctly serrate, neither strongly ciliated.

Mandibles.—The cutting edge divided into sixteen teeth; the strap-like secondary plate of the right mandible having four little slender teeth at its apex, one much longer than the other three; the first two spines of the spine-row on each mandible much widened distally and there cut into several little teeth, not so strong as those of the secondary plate on the left mandible, but stronger than the teeth of that plate on the right mandible.

First Gnathopods.—The first joint with the front margin not bulging, the hinder apex set about with five spines; the second joint with three spines about the hinder apex; the third joint with three spines on the hind margin; the wrist wider, but not longer, than the hand, having a spine at the apex of the convex front margin, and three at and near the apex of the straight hind margin; the hand with two spines adjacent to the convex front, the pectination of the straight hind margin continued round the slightly prominent apex; the finger more than half the length of the hand, the upper half of the inner margin pectinate.

Second Gnathopods not very different from those of *Vibilia propinqua*, but perhaps not quite in the normal condition, since in one the third joint is unusually short, and in the other the process of the wrist is very short and apically rounded, instead of acute as in the companion limb.

First Peræopods.—The third joint is narrow at the base, and then widens greatly, with very convex front margin, the length a little exceeding that of the fifth joint; the fifth joint is longer than the fourth, scabrous along the hind margin; the finger elongate, subequal in length to the fifth joint.

Second Peræopods similar to the first. The remaining pairs differing little from those of *Vibilia propinqua*, the fingers broken.

Pleopods.—Joints of the rami eleven in number in the pair examined.

The *Uropods* and *Telson* are in very close agreement with those of *Vibilia propinqua.*

Locality.—"Cape York," September 1874. One specimen.

Remarks.—The specific name is chosen to indicate the close agreement between this species and *Vibilia viatrix*, Bovallius, from the Atlantic, from which, however, it is separated by not having the fifth and sixth segments of the pleon distinct from one another.

Vibilia australis, n. sp. (Pl. CXLIX.).

Head with an acute rostrum which does not reach beyond the first joint of the upper antennæ; the lateral emarginations deep to correspond with the thickness of the peduncle of the upper antennæ; the first segment of the peræon dorsally the shortest, widened below, being produced at the rounded front corners; the first three segments of the pleon long and deep, the postero-lateral angles of the second segment squared, those of the first more rounded, those of the third more acute; the coalesced fifth and sixth segments not quite equalling the length of the fourth.

Eyes remarkable, in general form a long irregular oval, not quite parallel to the lateral margins of the head, the ocelli in three rows of about thirteen or fourteen each, forming a compact eye, but with this peculiarity, that as well the crystalline cones in the rows as the rows themselves stand apart from one another; the cones appear to be rather spherical than conical, or each of the component halves, which can be very clearly distinguished, may be a little more than a hemisphere; those at the ends of the rows are of diminished size.

Upper Antennæ stout; the peduncle short, the first joint broader than long, longer than the next two together, these being very short, but almost as broad as the first; the first joint of the flagellum more than twice as long as the peduncle, tapering at first very gradually, at the end more abruptly; at the outer side this joint has a rounded and smooth surface, forming on the inner side two sharp edges between which the inner surface or breast bulges a little, being set with a long brush of short setæ or cylinders in two series, the rows composing which number about thirty, with from one to five cylinders in each row; the edges near the end are serrate, and carry each about a dozen little tufts of small cylinder-like setæ; the almost acute apex of this large joint is tipped with two minute joints, the first scarcely longer than the second but considerably broader, and a little decurrent; the apex of each has a pair of setules.

Lower Antennæ very small (at least in our specimens). The first joint short, bent, not appearing beyond the margin of the head; the second longer than either the first or third; the third rather longer than the first, narrower than the second, slightly tapering,

with three distant serrations on the lower and seven or eight not distant on the upper side, all, as well as the tip, armed with setules.

Upper Lip.—The epistome a little arched above; the outer plate of the upper lip of a squared shape, with the distal margin unequally bilobed; the inner plate shorter, with the distal margin rounded.

Mandibles.—The cutting edge small, oblique, with eight teeth; the secondary plate narrower than the principal at both proximal and distal ends, but especially at the proximal; on the right mandible its teeth are extremely fine, and the plate is more widened distally than in some other species of this genus; the spine-row containing a few small but stout spines amidst others that are hair-like; the molar tubercle with the dentate crown moderately prominent; the palp three-jointed, longer than the trunk of the mandible, set a little behind the molar tubercle; the first joint short, the second more slender, more than twice as long; the third slender, tapering, longer than the other two together, with a series of small spinules or setules all along it, except quite at the base.

Lower Lip compact; the inner lobes small; the mandibular processes having an attachment close to the rounded distal end, which makes it difficult to separate the lip from its surroundings.

First Maxillæ.—The outer plate has several strong unequal spines at the distal end, amidst numerous hair-like setæ; the single joint of the palp is short, with the convex outer and nearly straight inner margins meeting in a narrow apex, and distally fringed with many hair-like setæ or spines.

The Second Maxillæ not made out with sufficient certainty for description.

Maxillipeds.—Inner plate or tongue short, the distal margin having the corners rounded and in the centre two little embedded spines; the outer plates not meeting at the base, the inner margin at first straight, serrate with six teeth, at each of which there is a little spine, the distal part oblique and finely denticulate; the outer margin very convex, with two or three little spines on the distal part; there is also a row of six or eight spinules on the outer surface, near the inner margin.

First Gnathopods.—Side-plates shallow, much broader than deep. First joint as long as the next four together, the breadth greatest just above the centre, the front margin being convex above and concave below; the second joint about as long as its breadth, with a spine at the apex of the hind margin, and a smaller one just above; the third joint not larger than the second, with a spine at the apex of the hind margin, the distal margin angled; the wrist nearly as long as the two preceding joints together, the lower half of the hind margin armed with about ten little teeth; the hand oval, a little longer than the wrist, abruptly narrower but not much, the front apex a little produced and finely pectinate, the hind margin less convex than the front, armed with many little teeth, the surface near the hind margin being also microscopically scabrous; the finger

more than half the length of the hand, its hind margin nearly straight, armed with a few small teeth, the front margin convex, the apex acute.

Second Gnathopods.—The side-plates rather deeper than in the preceding pair. The branchial vesicles oval, narrowed at each end, about as long as the first joint. The first joint longer than in the first gnathopods, but less wide, sinuous, widest distally; the second joint short, with a distal spine; the third joint longer than the second, five-sided, with two spines on the apex of the joint, and two others just below the end of the hind margin; the wrist longer than the hand, being produced behind it in a slightly divergent process, of which the oblique distal or inner margin is denticulate with about twenty teeth; the hand and finger are as in the first gnathopods, but the hand is a little narrower.

First Peræopods.—Side-plates much broader than deep, rather deeper behind than in front. Branchial vesicles as long as the first joint, and broader. The first joint a little sinuous, the front margin for the most part concave, and the hinder convex; the second joint a little longer than broad; the third considerably longer than the fourth, which is narrower than the third but broader than the fifth; the fifth nearly as long as the third, a little curved, the lower part of the concave hind margin pectinate, the apex also minutely pectinate; the finger slender, not strongly curved, acute, not half the length of the fifth joint, its inner margin a little pectinate.

Second Peræopods very similar to the first, but the third joint more decidedly longer than the fifth.

Third Peræopods.—Side-plates with the hind-lobe deeper than the front. Branchial vesicles of irregular form. The first joint pretty evenly expanded, at no part widely; the second joint about as broad as long; the remaining joints slender; the third much longer than the fourth, the front apex pectinate; the front margin of the fourth pectinate, but less strongly than the apical margin; the fifth joint not shorter than the third, the slightly concave front margin closely pectinate; the finger nearly straight, not nearly half the length of the fifth joint, with the upper part of its inner or concave margin pectinate, as in the other peræopods, the lower teeth of the pectination being much the longest.

Fourth Peræopods similar to the third, but the side-plates less broad, with the hind-lobe much deeper than the front, the branchial vesicles longer, the first joint rather longer and broader, the third and fifth joints rather shorter, and the fourth joint as strongly pectinate as the fifth.

Fifth Peræopods.—Side-plates not bilobed, a little broader than deep. First joint wider than in the preceding pairs, wider above than below, the front margin straight except at the top, the hind convex, slightly crenate, produced with rounded apex below the front; the second joint short, not reaching below the hind lobe of the first joint; the third joint twice as long as the second, widening from the base, both margins and the apices minutely serrate or pectinate; the fourth joint abruptly narrower than the third

and slightly longer, bent at the base; the fifth joint not as long as the preceding two together, but much longer than either, its front margin straight, and like the hinder minutely pectinate; the finger a little longer than the fourth joint, constricted just below the base, thence widening and from the middle again narrowing to a blunt apex, the armature of the margins being exceedingly minute. The whole limb is about two-thirds the length of the fourth peræopod.

Pleopods.—Coupling spines exceedingly minute; cleft spine stout, with the arms slender, unequal in length; the joints of the rami eight in number, the outer ramus narrower than the inner.

Uropods.—The peduncles of the first pair scarcely so long as the rami; the rami equal, lanceolate, reaching just beyond those of the third pair, each cut into five or six sharp teeth on the inner margin and nine or ten on the outer, the apex long, acute; the peduncles of the second pair reach as far as those of the first, the rami are as long as the peduncles; the inner ramus has the inner margin nearly smooth, the outer pectinate; the outer ramus is a little longer and has its outer margin cut into six teeth, the inner with the upper part pectinate, the lower part cut into three teeth, the apex long, acute; the peduncles of the third pair, which are set apart, reach much beyond those of the other two pairs, and are a good deal longer than the rami; the outer ramus has its outer margin smooth, the inner pectinate; the inner ramus the reverse; ventrally the distal margin in the various peduncles is pectinate.

Telson rather longer than broad, triangular, with a well-rounded apex, reaching more than half-way down the peduncles of the third uropods.

Length.—The specimen, in the position figured, measured one-fifth of an inch in a straight line from the apex of the upper antennæ to the back of the third pleon-segment.

Locality.—"March 9, 10, 1874, surface. South of Australia"; lat. 48° 18′ S., long. 130° 4′ E. Three specimens.

Remarks.—The specific name refers to the southern latitude from which the specimens were obtained. The species agrees with *Vibilia gracilis*, Bovallius, from the Pacific, in having a rostrum and in having a tapering flagellum to the upper antennæ, but here the carpal process of the second gnathopods is strongly instead of "sparingly" serrated, and the telson is not round but triangular.

Vibilia antarctica, n. sp. (Pl. CL.).

Frontal margin of the head shallowly convex; back of the animal broadly rounded, the first two segments of the peræon together shorter than the head; none of the segments either of the peræon or the pleon very long, the terminal part of the pleon having an unusually stumpy appearance.

Eyes not made out.

Upper Antennæ.—First joint of the peduncle broader than long, the two following joints together as long as the first, and each nearly as broad; the first joint of the flagellum longer than the peduncle, having some slender filaments along the inner margin; the minute second joint abruptly narrower than the apex of the first, not embedded in that apex, a little longer than broad, with some apical spinules, the third joint narrower than the second, a little longer, with four apical spinules.

Lower Antennæ not half the length of the upper, close beside which they are planted, the first two joints, which may be supposed to represent the peduncle, not being together so long as the third which represents the flagellum, and is tolerably stout, tapering, tipped with a setule.

Upper Lip pretty strongly ciliated or furred on the distal margin.

Mandibles.—The cutting plate very small compared with the broad trunk, the edge divided into ten or more small but sharp teeth; the secondary plate of the left mandible with about eight teeth along its broad edge; the secondary plate of the right mandible strap-shaped, with three or four apical teeth; behind the plates there is a group of cilia or hair-like spines, among which there are three stouter spines, the first large, distally pectinate; the molar tubercle is prominent, its crown set with very many little teeth, and an outer row of fairly long ones; the palp in the present specimen seemingly not fully developed, its first joint quite short; the second a little longer; the third rather longer than the first and second together, apically blunt.

First Maxillæ.—Inner plate small, oval; the outer plate not quite so large as the palp, distally set with seven spines among a crowd of spinules; the palp apically narrow, with slender spinules along the margins of the distal part, some at the apex a little less slender than the rest.

Second Maxillæ short, the inner plate shorter and apically broader than the outer.

Maxillipeds.—The inner plate broader than long, the convex distal margin a little serrate and crenulate, with two minute spinules embedded at the centre; the dentation of the margin in the new growth is seen to be much sharper than in the plate actually in use; the outer plates have the outer margins convex and smooth except for two little spines near the apex, the inner margins are to some extent concave, the middle part denticulate and carrying little spines, the distal part crenulate and pectinate; there are four or five small spines on the inner surface of each of the outer plates, and four on the inner surface of the joint below the plates.

First Gnathopods.—First joint a little sinuous; second short, like the first smooth and unarmed; third scarcely longer than the second, with one apical spine, which, however, is present only on one of the limbs; the wrist distally widening, broader and a little longer than the hand, with one apically plumose spine on the channelled apex of the hind margin; the hand with smooth convex front margin, the hind margin straight, with a

small spine where it meets the rounded, channelled, distal margin, which as usual in this genus is faintly pectinate and armed with a spinule; the finger is short, tapering from the base to an angle of the hinder margin, and then again tapering to the apex, in which a spine-like nail is inserted; the hand and wrist are both scabrous on and near the hind margin.

Second Gnathopods.—The branchial vesicles oval, small. The first and second joints of the limb similar to those of the first pair but longer; the third joint longer than the second, with a small and a large feathered spine on the hind margin, and at the almost acute apex a large spine with a small one close beside it; the proximal part of the wrist as long as the hand, the narrowly triangular hinder process nearly as long as the hand, scabrous, faintly serrate on its inner or front margin; the hand narrower than in the first pair, more strongly scabrous, and having two little spines at the apex of the hind margin; the finger shorter than that of the first gnathopods.

First Peræopods.—Branchial vesicles larger than the preceding pair, not so long as the first joint of the limb. The first joint broader than in the gnathopods, not sinuous; second joint longer than broad; third joint broader but shorter than the fourth, with one slender spine standing out from the hind margin; fourth joint slightly curved, having like the third a minute spinule a little above the apex of the convex front margin; fifth joint a little longer than the fourth, with a spinule a little above the apex of the hind margin, and another at the apex of the front; the finger not half the length of the fifth joint, tapering from the base nearly to the bent tip, the hind margin a little pectinate.

Second Peræopods like the first.

Third Peræopods like the two preceding pairs, the first joint scarcely more dilated, the fourth and fifth joints and the finger longer, the fourth joint having a little spine at the apex of the front margin, and its distal margin pectinate, the front margin of the fifth joint being faintly scabrous, and having two spinules; as in the other pairs, the termination of the finger is not sharp and strong, though the new growth seems to indicate that it is normally acute.

Fourth Peræopods like the third, but with all the joints except the finger rather longer.

Fifth Peræopods equal in length to the two first joints of the fourth pair, the first joint not broad, fully as long as the following five together, the third a little longer than the second, the fourth than the third, the fifth than the fourth, the fifth having a slender spine at the apex of the front margin; the finger is oval, about as long as the third joint, scarcely scabrous.

Pleopods.—Peduncles scarcely so long as the rami, coupling spines short, with long apical retroverted teeth; the cleft spine represented by a minute rudimentary acute spine near the top of the inner margin of the long first joint of the inner ramus; interlocking process of the outer ramus very short; joints of the inner ramus numbering from six to seven, of the outer from seven to eight.

Uropods.—Peduncles of the first pair a little shorter than the outer ramus, which has four strong teeth on the outer and two on the inner margin near the apex, the upper part being finely pectinate; the rather shorter inner ramus has one or two teeth on each margin; the second pair are similar to the first, but shorter and with fewer teeth; the third pair are shorter than the second, the peduncles set wide apart, broad, longer than the rami, of which the outer is slightly the longer, denticulate on the inner margin and having an apical spinule; the inner ramus is denticulate chiefly on the outer margin.

Telson transversely oval, much broader than long, less than half the length of the peduncles of the third uropods.

Length.—One-fifth of an inch.

Locality.—"Antarctic, surface, February 2, 1874"; lat. 52° 4′ S., long. 71° 22′ E. One specimen.

Remarks.—The specific name alludes to the place of capture; the shape of the telson seems to separate this species from all others within the genus that have been hitherto intelligibly described.

Vibilia sp.

Where the fifth and sixth segments of the pleon coalesce there is a small groove at the centre of the back, limited to about a quarter of the whole dorsal breadth.

Eyes nearly round.

Upper Antennæ nearly as in *Vibilia viator.*

Lower Antennæ.—The flagellum with three joints, of which the second is the shortest.

Upper Lip with the distal lobes strongly furred.

Mandibles.—The cutting edge with fifteen or sixteen teeth; the first two of the stouter spines in the spine-row having each one lateral denticle on the outer edge.

Lower Lip.—The outer corner of the principal lobes not flanked by a pronounced tooth, yet with a little irregularity of outline.

First Maxillæ.—Inner plate small, oval.

Maxillipeds with three spinules on the outer margin of the outer plates.

Gnathopods distinguished from those of *Vibilia australis*, chiefly in the first pair, by having the first joint's front margin a little less bulging, and in the second by having the process of the wrist narrower, reaching nearly to the apex of the hand.

Uropods.—Peduncles of the first pair reaching just to the apex of the telson, a little longer than the rami; the narrower peduncles of the second pair reaching very nearly as far as those of the first, very little longer than the rami; the peduncles of the third pair the broadest, intermediate in length between the other two pairs, longer than the rami, the outer ramus a little shorter than the inner; the rami of the second pair a

little shorter than those of the first, and the third than those of the second, the armature nearly as in *Vibilia propinqua*.

Telson triangularly rounded, not quite half the length of the peduncles of the third uropods.

Length.—One-third of an inch.

Locality.—"Between Kerguelen and Heard I., February 3, 1874, surface"; lat. 52° 20′ S., long. 72° 14′ E. One specimen.

Remarks.—There seems to be a close resemblance between this form and *Vibilia gracilenta*, Bovallius, from the Atlantic, but in that species the hinder corners of the coalesced segments of the pleon are "strongly produced backwards," and the peduncles of the third uropods are "linear," neither of which characters suits the Challenger specimen.

The following list shows the localities at which specimens of the genus *Vibilia* were obtained, arranged in sequence from the North Atlantic round to the North Pacific.

1. "June 18–19, 1873, surface"; between Stations 62 and 63, lat. 35° 7′ and 35° 29′ N., long. 52° 32′ and 50° 53′ W. One specimen.

2. "Between Bermuda and Azores, surface"; lat. 32° 29′ and 39° 0′ N., long. 68° 48′ and 27° 0′ W. Two specimens.

3. "April 27, 1876, North Atlantic, surface"; between Stations 352 and 353, lat. 10° 55′ and 26° 21′ N., long. 17° 46′ and 33° 37′ W. Three specimens.

4. "April 13–14, 1876, off Africa, surface"; near Station 352, lat. 10° 55′ N., long. 17° 46′ W. One specimen.

5. "October 5, 1873, South Atlantic, surface, night"; between Stations 130 and 131, lat. 26° 15′ and 29° 35′ S., long. 32° 56′ and 28° 9′ W. One specimen (*Vibilia milnei*).

6. "Vibilia, South Atlantic, November 10, 1873"; Station 140, lat. 35° 0′ S., long. 17° 57′ E. One specimen, mounted in Canada balsam.

7. "March 10, 1876, South Atlantic, surface"; Station 332, lat. 37° 29′ S., long. 27° 31′ W. Six specimens.

8. "March 9, 1876, South Atlantic, surface"; Station 331, lat. 37° 47′ S., long. 30° 20′ W. Five specimens.

9. "February 2, 1874, Antarctic, surface"; Station 150, lat. 52° 4′ S., long. 71° 22′ E. One specimen (*Vibilia antarctica*).

10. "Between Kerguelen and Heard I., February 3, 1874, surface"; near Station 150. One specimen.

11. "March 9–10, 1874, south of Australia, surface, lat. 48° 18′ S., long. 130° 4′ E."; between Stations 158 and 159. Three specimens (*Vibilia australis*).

12. "August 23, 1874, New Hebrides," between Stations 179 and 180, lat. 15° 58′ and 14° 7′ S., long. 160° 48′ and 153° 43′ E. One specimen.

13. "August 25, 1874, Api to Cape York, surface"; Station 181, lat. 13° 50′ S., long. 151° 49′ E. One specimen.

14. "Cape York"; lat. 10° 30′ S., long. 142° 18′ E. One specimen (*Vibilia viator*).

15. "Pacific." One specimen.

16. "April 4, 1875, off Volcano I., Pacific, surface"; between Stations 229 and 230, lat. 22° 1′ and 26° 29′ N., long. 140° 27′ and 137° 57′ E. Four specimens (*Vibilia propinqua*).

17. Station 245; lat. 36° 23′ N., long. 174° 31′ E. One specimen.

None of the Challenger specimens are as much as half an inch in length. The largest species yet recorded appears to be *Vibilia edwardsii*, Spence Bate, from the southern Orkneys, the length attributed to this species being three-quarters of an inch. *Vibilia kroeyeri*, Bovallius, from Greenland, has a length of 12 mm. *Vibilia jeangerardii*, Lucas, from the Mediterranean, is 10 mm. long. *Vibilia borealis*, Bate and Westwood, from Banff, is seven-twentieths of an inch in length, but neither the size nor the colour nor any of the details given seem sufficient to distinguish this species from that named by Lucas. The figure and description of *Vibilia affinis*, Spence Bate, from Java, are also, I think, insufficient for any specific determination. Except in the absence of colour markings, the specimens from various stations in the Atlantic differ but little from *Vibilia jeangerardii*, Lucas, and the colour markings may have disappeared during the ten or twelve years that the specimens have been preserved in spirit. *Vibilia edwardsii*, Spence Bate, and *Vibilia longipes*, Bovallius, differ from the rest of the group by the great disparity in length between the second and fourth peræopods, and *Vibilia pyripes*, Bovallius, from "tropical parts of Atlantic," is distinguished by having the "telson round, very broad, longer than last peduncles."

Family Cyllopodidæ, Bovallius, 1887.

The family is defined by Bovallius as follows:—

"Head globular; eyes large, occupying almost the whole sides of the head. First pair of antennæ fixed at the anterior side of the head, with the first joint of flagellum tumid, conical; second pair fixed at the inferior side of the head, angulated. Mandibles with palp. Dactyli of seventh pair of pereiopoda [fifth peræopods] transformed."

It may be questioned whether there was any pressing necessity for separating the single genus included in this family from the neighbouring Vibilidæ, a family which is itself as yet not overcrowded with genera. Mr. Spence Bate indeed is so much impressed with the likeness between *Vibilia* and *Cyllopus* as to say of the two genera, that "had

they been found associated, they might have been supposed to be sexually related."[1] There are objections to that particular inference from the fact, but the fact itself of their being found associated is highly probable, since Mr. Spence Bate records a *Cyllopus* and a *Vibilia* from the same habitat "near the Powel Islands," and the Challenger specimen of *Cyllopus* bears the same date of capture as specimens of *Vibilia*.

Genus *Cyllopus*, Dana, 1852.

1852. *Cyllopus*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 981, 989, 1519.[2]
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 305.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 11.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 555.

For the original definition of the genus, see Note on Dana, 1852 (p. 268). Bovallius in 1887 defines it as follows :—

"Head globular, a little tumid. Eyes large, filling almost the whole sides of the head. First pair of pereiopoda [first gnathopods] simple or subchelate. Second pair with a more or less produced carpal process. Femur of seventh pair [first joint of fifth peræopods] much longer than the following joints together. Telson small, rounded."

The epithet "rounded" is scarcely applicable to the telson, since in *Cyllopus lucasii*, Spence Bate, it is said to be lanceolate. Spence Bate notices in regard to the species which he calls "*Cyllopus magellanicus*," that the second joint of the mandibular palp is the longest. This is the case in the Challenger specimen, and if it be a character of all the species it would be convenient to include it in the generic definition. *Cyllopus magellanicus*, Spence Bate, is distinguished by Bovallius from Dana's species of that name, and renamed "Cyllopus Batei."

Cyllopus hookeri, n. sp.

Head with a small rostral angle between the upper antennæ; back rounded; first three segments of the pleon with convex lower margins, serrate near the rounded postero-lateral angles; the coalesced fifth and sixth segments have the line of coalescence marked by a slightly convex groove at the centre of the back equal to about a quarter of the dorsal breadth.

Eyes dark, occupying almost the entire surface of the head; many of the multitudinous ocelli are very small, the crystal cone being in some cases spherical.

Upper Antennæ.—The first joint of the peduncle longer than the two following

[1] Brit. Mus. Catal., p. 305.

[2] It was no doubt by an oversight that Dana omitted *Cyllopus* from the classification of the Hyperidea at page 1442.

together, all three broader than long; the first joint of the flagellum considerably longer than the peduncle, for some distance nearly as thick as the peduncle, then tapering gradually, with a narrowed terminal piece more than a third, but less than half, the length of the joint; the second joint is minute, a little longer than broad, and in our specimen this is the last.

Lower Antennæ in the present specimen straight and almost smooth, situated very near one another; the first free joint scarcely longer than broad, the second a little, and the third a good deal, longer than the first; the following joint, which is probably the first of the flagellum, is nearly as long as the three preceding together and longer than the two subequal terminal joints combined.

Upper Lip.—The outer plate distally unsymmetrically bilobed with a not very deep emargination, each lobe having fur directed towards the emargination; the inner plate has a slightly convex distal margin which is hairy.

Mandibles.—The upper margin of the trunk behind the palp is straight; the cutting plate has about nine teeth, of which the lowest stands somewhat apart from the rest; the secondary plate of the left mandible has seven teeth very similar to those of the principal plate; on the right mandible it seems to be rather different, with one long tooth and the rest slighter; besides some ciliation above the plates there is a spine-row, with several strong, more or less denticulate spines among others that are slender and hair-like; the molar tubercle is prominent, cylindrical, with strongly dentate crown, in general appearance recalling the form common in the Gammarina; the first joint of the palp is twice as long as broad, but short compared with the other joints; the second is between two and three times as long as the first, longer and much broader than the third, narrowest at the two extremities, a little bent near the lower end; the long and narrow third joint has some small spines or setules along the convex hind margin of the acute apex.

Lower Lip.—Principal lobes rather broad, ciliated; the rounded apices of the mandibular processes scarcely free.

First Maxillæ.—Inner plate small, oval, smooth; the outer plate with numerous slender spines of various lengths on the surface and margins; the distal margin truncate, carrying eight strong but unequal spines, most of them having one or two lateral denticles; the palp joint is strongly ciliated, its outer margin convex, the inner nearly straight for more than half the distance from the base, the remainder concave, a spine being placed at the junction of the two portions; there are also some small spines on and near the very narrow truncate apex.

Second Maxillæ.—The two plates appear to be coalesced into a single plate with two apices, of which the inner is the larger and more prominent; there are numerous hair-like spines and slender spines about each apex, and a small spine at each apex. In the genus *Vibilia* these two plates are seen to be partially coalesced, and here, if my observation is correct, the coalescence is carried a step or two further.

Maxillipeds.—The inner plate nearly as broad as long, the rounded corners of the distal margin serrate, the centre almost flat, with two little embedded submarginal teeth; the outer plates with their bases not contiguous, the inner margin at first smooth, then divided into five or six irregularly serrate teeth with spinules, the distal part convex, irregularly denticulate, the two plates here becoming contiguous; there are five small spines on the outer surface and on the distal part of the outer margin there are three together with some cilia.

First Gnathopods.—The first joint most widened near the centre, containing gland-cells, having a subapical spinule to the hind margin; the second joint as broad as the length; the third scarcely longer or wider than the second, with the hinder apex not very acute, resting on the wrist and having a spine adjacent; the wrist a little longer than the hand, broader, the hind margin straight, the front convex, the distal margin very faintly pectinate; the hand with spinules at two points of the slightly convex front margin; the hind margin straight, much of it and the distal margin beset with little groups of little tooth-like spines; the finger curved, tapering, more than half the length of the hand, its inner margin pectinate with little spine-teeth, of which there are also some adjacent to the margin.

Second Gnathopods.—Branchial vesicles as long as the first joint, broad, distally widened. The first joint a little sinuous, with two or three spines at the lower part of the hind margin; the second joint with two spines on the hind margin; the third joint much longer than in the preceding pair and than the second joint, with three spines along the hind margin, the lowest the longest, and three larger spines at the apical margin; the wrist longer than the hand, half of which it clasps with the produced hinder process, its distal margin on the inner surface and round the process being fringed with little teeth; the hand nearly as in the first pair, but with the hind margin a little convex, more strongly pectinate with little groups of teeth, which do not appear to be triple-pointed as described by Spence Bate for his "*Cyllopus Magellanicus*," though the teeth in many of the groups are set extremely close together; the finger as in the first pair.

First Peræopods more bulky than the gnathopods; the side-plates much larger than the preceding pair, broader than deep, with both ends rounded, the lower margin straight. The first joint, as in the gnathopods and the three following pairs of peræopods, containing gland-cells, with two or three little spines on the hind margin; the third joint broader and very little longer than the fourth; the fifth joint a little longer than either of the two preceding joints, with a setule here and there; the finger about half the length of the fifth joint, a little bent, the upper half of the inner margin pectinate.

Second Peræopods like the first; the third, fourth, and fifth joints a little longer.

Third Peræopods.—Side-plates bilobed, broader than the preceding pair. Branchial vesicles longer than the first joint. The first joint rather shorter than in the preceding pair, but winged, with about six little spines along the front margin; the second joint

scarcely longer than broad; the third joint longer than in the preceding pair, rather shorter than the fourth joint, which has a little spinule at the apex of the straight front margin, and a scarcely developed tendency to pectination; the fifth joint curved, considerably longer than the fourth, the concave front margin with fine decurrent pectination; the finger rather more than a quarter the length of the fifth joint, armed like that of the preceding peræopods.

Fourth Peræopods.—Side-plates bilobed. Branchial vesicles widened above, narrowed below, rather longer than the first joint. The first joint much larger than in the preceding pair, with six spines along the front margin, the hind margin smooth, scarcely convex except at the two extremities; the rest of the limb similar to the preceding pair, except that the fourth joint is more decidedly though very finely pectinate, and the fifth joint is longer. The first and fifth joints being longer, and the others certainly not shorter than in the preceding pair, it follows that the whole limb is longer than that of the third peræopods.

Fifth Peræopods not much longer than the first joint of the fourth. The first joint twice as long as the remaining joints together, broad, looking very like a branchial vesicle, the front margin convex, with four little spines on the lower part, the apex drawn down a little below the hind margin, which is almost straight except at the two extremities; the second joint as broad as the length, with a subapical spine on the front margin; the third joint narrower, not longer, than the second; the fourth a little longer than the second; the fifth narrower than the fourth, not longer than the third; the sixth about as long as the fifth, tapering slightly to a blunt end, the front corner angled, furry, with a minute spinule at the angle.

Pleopods.—Coupling spines small, the apices forming as it appears a circlet of retroverted teeth, below which is another group of smaller teeth; the cleft spine without any considerable dilatation of either arm; the first joint of the inner ramus having three plumose setæ on the inner margin below the cleft spine; the first joint of the outer ramus with a short, broad, interlocking process, apically narrowed, the outer margin of the joint having several plumose setæ; the joints of the inner ramus nine to ten, of the outer ten to eleven. The terminal joint of the outer ramus in two or three instances in this specimen had but one seta instead of two, an anomaly which I have nowhere else observed.

Uropods.—Peduncles of the first pair subequal in length to the rami, the outer margin pectinate, the inner with an acute apex; the rami lanceolate, reaching beyond those of the third pair, the outer a little the shorter, pectinate along the outer margin and having five larger teeth on the lower part; the inner margin with two teeth and a little pectination; the inner ramus very similarly armed, but with four teeth on the inner margin; peduncles of the second pair much shorter than those of the first, shorter than the rami; the rami reaching beyond the peduncles of the third pair, much shorter than

the rami of that pair; the outer the shorter, with a little serration of the outer and not much more of the inner margin, the apex acute; the inner ramus also similar, a little more strongly armed; the peduncles of the third pair set wide apart, a little shorter than those of the first pair, much longer than the rami, the inner apex acute; the rami shorter than those of the second pair, the outer the shorter, the margins only a little denticulate.

The Telson much broader than long, very short, triangularly rounded, its base occupying the space between the third uropods.

Length, outstretched, about a quarter of an inch.

Locality.—March 9, 1876, South Atlantic, surface; lat. 37° 47′ S., long. 30° 20′ W.; surface temperature, 64°·5. One specimen.

Remarks.—The specific name is given out of respect to Sir J. D. Hooker, among whose numerous unpublished drawings of Amphipoda there is one representing a species of this genus; the colouring represents the head as almost black, evidently occupied almost entirely by the eyes, the body a deep blue, the antennæ a lighter shade of the same colour, and the legs light red. In *Cyllopus armatus*, Bovallius, the first flagellum joint of the upper antennæ is drawn out to a much greater extent, there is a much greater disproportion between the second and third peræopods, the rami of the second uropods are more nearly equal to those of the third, the telson is differently shaped, and the size of the animal much greater. *Cyllopus magellanicus*, Spence Bate, has the rami of the third uropods "scarcely one-fourth of the length of the peduncle," the telson cylindrical, and the body of the animal "thickly covered with coarse stellate spots of black pigment," whereas the Challenger specimen was colourless except as to the eyes. From *Cyllopus magellanicus*, Dana, if the figures of that species can be trusted, the present species is distinguished by having the fifth and sixth segments of the pleon coalesced instead of free, by having the peduncles of the second uropods much shorter as compared with those of the first, and by having the first joint of the fifth peræopods of greater breadth; to these marks of distinction might be added the fact that the telson is free, not, as in Dana's figure, coalesced with the preceding segment, but the figure cannot perhaps be relied on for so minute a detail.

Dr. v. Willemoes Suhm, in a letter from Cape York, September 1874,[1] refers to the capture of a species of *Cyllopus*, but a mounted specimen so named, in his handwriting, with his monogram attached, and labelled as taken on the voyage from "Api to Cape York," belongs not to *Cyllopus* but to *Paraphronima*.

[1] See Note on v. Willemoes Suhm, 1875 (p. 452).

Family Lanceolidæ, 1887.

Bovallius, who in 1885 had reinstated Say's genus *Lanceola*, in 1887[1] established the family Lanceolidæ to receive it, with the following diagnosis:—

"Head small, anteriorly truncated, not tumid. Eyes very small, often indistinct. First pair of antennæ short, high, compressed, fixed at the anterior side of the head. Second pair long angulated, fixed at the anterior side of the head. Mandibles with palp. Three posterior pairs of pereiopoda with retractile dactyli. Seventh pair [fifth peræopods] not transformed."

In a subsequent work of the same year Bovallius varied the description as follows:—

"Head small, not tumid, anteriorly truncated. Eyes small. First pair of antennæ tumid. Second pair filiform, not angulated, fixed at the anterior side of the head. Mandibles with palp. Seventh pair of pereiopoda [fifth peræopods] not transformed. Peduncles of uropoda normal."

That the lower antennæ are not folded as in the Platyscelidæ is in agreement with the Challenger species belonging to this family, but neither do the dimensions of the lower antennæ in those species agree with the epithet "filiform."

Genus *Lanceola*, Say, 1818.

1818. *Lanceola*, Say, Journ. Acad. Nat. Sci. Philad., vol. i. pt. ii. p. 317.
1825. „ Desmarest, Consid. gén. sur la classe des Crustacés, p. 272, note.
1830. *Hyperia* (*pars*), Milne-Edwards, Ann. d. Sci. Nat., tome xx. p. 387 (extr., p. 36).
1838. „ „ Milne-Edwards, Hist. Nat. des Anim. sans Vert., tome v. éd. ii.
1840. „ „ Milne-Edwards, Hist. Nat. des Crust., tome iii. p. 77.
1840. „ „ Lucas, Hist. Nat. des Crust., p. 234.
1844. „ „ De Kay, Zoology of New York, pt. vi., Crustacea.
1858–74. „ „ Chenu and Desmarest, L'Encycl. d'hist. nat., Crustacés, p. 48.
1862. *Vibilia* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 304.
1885. *Lanceola*, Bovallius, Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 10, No. 14, p. 3.
1886. „ Forsstrand, Det arkt. hafsområdets djurgeogr. begränsning, p. 40.
1887. „ Bovallius, Systematical List of the Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 5.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. 553.
1887. „ Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 55.

For the original definition of the genus, see Note on Say, 1818 (p. 102). The British Museum Catalogue, in the description of Say's type-species under the name *Vibilia pelagica*, speaks of the upper antennæ as "reaching to the extremity of the peduncle of the inferior pair," whereas Say's words are "attaining the middle of the third joint of the inferiores"; in the account of the peræopods, "third pair longest" is evidently a misprint for—third pair longer. In 1887 Bovallius gives the following definition of the genus:—

[1] Systematical List of the Amph. Hyper., p. 5.

"Head anteriorly concavated, the upper part more or less projecting into a rostrum. Eyes small, like those in the Gammarids, placed uncommonly far down on the sides of the head. First pair of antennæ long, the flagellum more or less lanceolate, tumid; somewhat like that in the Vibilidæ. Second pair are long, filiform, with very long joints. Urus [segments in connection with the uropods and telson] like that of the Hyperiidæ."

In 1885 Bovallius mentions that among his new species of *Lanceola* he has "two totally blind ones," in which case the generic character ought to speak of "eyes small or wanting"; that the lower antennæ are not always filiform has been already observed.

In this genus the ganglionic chain has its two halves clearly distinguishable, the longitudinal commissures being actually separate, in contrast to the genus *Vibilia* in which they are closely united. The muscles do not form thick and compact groups, but slender bundles of which the components are easily separable, and in the large segments of the peræon, instead of a single longitudinal group on either side of the back, there are several slender strips of muscle very distinctly separated.

Lanceola pacifica, n. sp. (Pls. CLI., CLII.).

Rostrum small, obtuse, a little depressed; back of the peræon rounded, its third segment the longest, the second and fourth nearly equal to the third; the pleon-segments slightly carinate dorsally, the first three also laterally ridged, having the lower part of the hind margin fringed with spinules and sloping forwards to form an obtuse angle with the lower margin, which is likewise bordered with spinules.

Eyes small but prominent, tending to oval, placed obliquely between the upper and lower antennæ.

Upper Antennæ reaching nearly to the middle of the fourth joint of the lower antennæ; the peduncle short and stout, the first joint not so long as broad, as long as the two following together; the flagellum three times as long as the peduncle, the bulky first joint channelled on one side, and on the other fringed with a brush of short setæ or filaments in many transverse rows; the apex is obliquely truncate and is followed by a very short laminar second joint, with one edge folded, to which succeed two minute terminal joints, much less broadly winged.

Lower Antennæ.—First joint obscure; second joint short, with a small gland-cone; third joint twice as long as broad, very setiferous; the fourth joint two and a half times as long as the third, as long as the whole upper antennæ but not quite so broad, triangular in transverse section; fifth joint as long as the third and fourth together, narrower, tapering to a point, of triangular section till near the apex. It is possible that the fourth joint may represent the fourth and fifth joints of the peduncle coalesced, and that the whole of the tapering fifth joint may be the flagellum; that its apical part belongs to the flagellum can not be doubted.

Epistome prominent, helmet-shaped.

Upper Lip not quite symmetrically bilobed, the emargination between the two lobes being very deep.

Mandibles.—The cutting edge sharp, oblique, more than two-thirds of the breadth of the trunk, the upper angle produced into a tooth; this tooth on one mandible crosses its fellow on the other just above the emargination of the upper lip, under which the cutting edges of the mandibles lie, except at their lower extremities; there is a small tooth on the lower margin a little to the rear of the cutting edge, and to the rear of this tooth there is a row of short spinules and setules; the left mandible has a small tooth-like secondary plate high up on the inner surface; each mandible has on the inner surface a curved diagonal brush of numerous setæ extending from the lower front angle to near the base of the palp; the palp is set very far back, the first joint short, a little longer than broad, the second joint long, apically a little widened, with setæ along one margin and many about the distal end, the third joint shorter than the second, apically pointed, one margin convex, smooth, the other sinuous, furred with cilia.

Lower Lip.—Pl. CLII. shows the two mandibles from the inner side, clipped above by the transversely oval inner plate of the upper lip, and supported below near the outer corners by the mandibular processes of the lower lip. The figure of the mouth organs in Pl. CLI. shows the two mandibles from the outer side clipped above by the outer plate of the upper lip, but the lower lip is concealed by the maxillæ.

First Maxillæ.—The inner plate broad, with sinuous distal margin, both that and the surface carrying very numerous spinules; the outer plate not so broad as the inner, reaching beyond it, with many spinules, especially on and near the inner margin, the somewhat narrowed apex carrying on the inner side a rather slender spine followed closely by a very stout one, with another equally stout but shorter below it on the outer side, and somewhat further down a stout curved spine, followed by another planted on the surface just within the outer margin; there are also a few small spines on the trunk of the joint to which this plate belongs; the palp rather longer than the outer plate, near the middle of the base of which it is attached by a ridge of its inner surface, this attachment causing both the margins of the palp to face inwards; that which appears to be the true inner margin has several distant short spine-teeth spaced along it; between that at the almost acute apex and the next below it there is a marked emargination; on the outer slope of the apex there is a feathered spine; the outer margin is convex, pectinate with little spine-teeth for more than half its length from the apex.

Second Maxillæ.—The inner plate shorter but broader than the outer, with thirteen spines of various lengths planted on and just within the serrate distal margin, the outer and inner margins and one surface having cilia or spinules on the distal portion; the outer plate has eight spines on the truncate oblique apex, the outer and inner margins and one surface armed as in the other plate.

Maxillipeds.—The inner plate short, strongly projecting, cleft far down the middle, the distal margin of each half convex, set with many spinules; outer plates to a certain extent "prismatic," each having two inner margins, one of which carries several long and short spines; the outer margin is convex, smooth, the apical carries three or four unequal spines in notches; the outer surface of the plates is armed with many unequal spines, nineteen or twenty being counted on one plate and thirteen on the other; the basal joint carrying these plates has several spines on each lateral margin, and at the centre of the distal margin a small lobe or plate apically surmounted by two spines.

First Gnathopods.—Side-plates shallow, the lower margin nearly straight. The first joint nearly equal in length to the following four together, the inner front margin fringed with setiform spines, the hinder margin with spines of various lengths; the second joint short, with some spines on the hind margin; the third joint with the front margin on the inner surface longer than that on the outer, the hind margin with several slender spines; the wrist widening distally, much longer and broader than the hand, the front margin much longer than the hind one, each with spines or spinules at intervals, the sinuous distal margin with many spines, especially on the inner surface; the hand almost triangular, broadest at the base, not twice as long as broad, with five or six spines on each serrate margin and four on the inner surface, the narrow apex truncate; the finger very narrow, straight, when complete about half the length of the hand.

Second Gnathopods.—The side-plates shallow, broader than the first pair, the lower margin very sinuous. Branchial vesicles elongate, oval, narrower than the first joint and much shorter. Marsupial plates in an early stage of development, smooth-edged, as wide as the branchial vesicles and rather more than half their length. The first joint as long as the wrist, hand, and finger together, fringed with spines on both margins; the second and third joints nearly as in the first gnathopods, but the second rather longer; the wrist much longer and much narrower than in the first pair, similarly armed, distally widened, but not greatly; the hand shorter and narrower than the wrist, longer but narrower than the hand of the first gnathopod, with seven small spines on the hind margin and three or four on the front.

First Peræopods.—Side-plates broad, shallow, especially in front, the lower margin sinuous. Branchial vesicles much larger than the preceding pair, as long as the first joint and broader. The marsupial plates much narrower than the branchial vesicles and less than half their length. The first joint nearly as in the second gnathopods, but rather broader; the second joint rather longer than broad; the third joint shorter and much narrower than the first, considerably longer than the fourth or fifth; the fourth joint rather shorter but broader than the fifth; the fifth joint narrowing to the apex, slightly curved, having like the two preceding joints several small spines on the hind margin; the third has also several spines on the front margin, and the fourth has two or three;

the fourth and fifth joints are to some extent three-sided, or may be said to have a double hind margin; the finger small, curved, acute, not a fifth of the length of the fifth joint.

Second Peræopods like the first, but the joints a little longer, especially the fifth joint. The branchial vesicles similar to the preceding pair, but much broader; the marsupial plates much narrower than the preceding pair.

Third Peræopods.—The side-plates like the preceding pair shallow, especially in front, and broad. Branchial vesicles larger than the preceding pairs. The marsupial plates similar to the preceding pair. The first joint narrower and longer than in the second peræopods; the third, fourth, and fifth joints also respectively a little longer than those of the preceding pair, their front margins minutely spined, the hinder margin of the third being also spined; the fifth joint is straight, its hind margin smooth, nearly parallel with the front till the apex, which is rounded, produced behind the insertion of the finger, with oblique front margins, between which the minute, strongly curved, acute claw can be exserted or retracted.

Fourth Peræopods.—Branchial vesicles with the oval outline interrupted below the middle of the hind margin, a sort of suture marking off a narrow region from the base as far down as this interruption, below which the vesicle is narrowed. The first joint of the limb not longer than in the preceding pair, but broader, carrying some small spines along the front margin; the second and third joints longer and stouter than in the third peræopods; the fourth joint nearly as long as the fourth and fifth together in the preceding pair; the fifth joint narrower than the fourth, but considerably longer, this and the three preceding joints unarmed; the retractile finger very little larger than that of the third peræopods, with several little unequal spines on the upper part of the front margin, not decurrent.

Fifth Peræopods not half as long as the fourth. The side-plates small, narrower behind than in front. The first joint narrowing a little distally, its front margin carrying some small spines, the convex hinder margins nearly smooth; the third joint a little longer than the fourth, the two together scarcely as long as the first; the fifth joint longer than the third; the retractile finger smaller than in the two preceding pairs, with small spines or teeth on the inner margin directed slightly upwards.

The relative proportions of the peræopods may be represented by the numbers 40, 44, 48, 66, 36.

Pleopods.—Peduncles stout; coupling spines short and small, each with four or five retroverted teeth on either side; the cleft spine stout, strongly feathered, the acute arm longer than the other, denticulate on two edges; the long first joint of the inner ramus has five feathered setæ below the cleft spine; there are fifteen joints in this ramus and nineteen in the outer.

Uropods.—Peduncles and rami all more or less prismatic or three-sided in transverse

section; peduncles of the first pair much longer than the rami; the inner margin fringed with unequal spines, the outer finely denticulate; the rami narrow, lanceolate, the outer and inner margins denticulate, the ridge of the under surface carrying a few spines, the inner ramus a little longer than the outer; peduncles of the second pair not so long as those of the first but much broader, with some small spines on the three margins, the rami similar to those of the first pair, subequal to them in length, but broader; the peduncles of the third pair not quite so broad as those of the second, much shorter; the rami shorter than the peduncle, similar to those of the second uropods, but not quite so long, and the inner ramus broader.

Telson long and narrow, nearly two and a half times as long as broad, subequal in length to the peduncles of the third uropods, not longer though extending a little beyond them; the nearly acute apex is rounded and microscopically pectinate.

Length.—In the position figured, in a straight line from the rostrum to the back of the third pleon-segment, the specimen measured eleven-twentieths of an inch.

Locality.—Station 241; lat. 35° 41′ N., long. 157° 42′ E.; depth, 2300 fathoms; bottom, red clay; bottom temperature, 35°·1; surface temperature, 69°·2. One specimen. Trawled.

Remark.—The specific name refers to the capture of this species in the depths of the North Pacific Ocean; it bears a great general resemblance to *Lanceola sayana*, Bovallius, but in that species from the Atlantic the rostrum is acute, the segments of the peræon are imbricated, and the telson is longer than the peduncles of the third uropods.

Lanceola sp.

Rostrum curved, acute; back of peræon smooth.

Eyes minute, prominent.

Antennæ nearly as in *Lanceola pacifica;* the fifth joint of the lower pair rather less robust, followed by a small joint, scarcely longer than broad, to which succeeds a more slender joint, about twice as long, having a little setule on one side, and at the apex two setules, one of which is longer than the joint.

Mouth Organs and *Gnathopods* closely resembling those of *Lanceola pacifica.* The branchial vesicles of the second gnathopods are elongate oval, shorter than the first joint of the limb. The marsupial plates are strongly dilated like branchial vesicles, much broader and longer than the first joint of the limb, encircled by numerous slender setæ, which are rather long, but not of a length equal to the breadth of the plates.

Peræopods.—The first pair eleven-twentieths of an inch, the second over three-fifths, the third scarcely so long as the second, but still just over three-fifths of an inch,

the fourth three-quarters of an inch, the fifth just under two-fifths of an inch long. The relative proportions may be represented by the numbers 66, 74, 73, 90, 48. In the first pair the branchial vesicles and marsupial plates are larger than in the second gnathopods; in the second pair the branchial vesicles are larger, the marsupial plates smaller than in the preceding pair, the vesicles as long as the first joint of the limb, the plates longer; in the third pair the branchial vesicles are longer and the marsupial plates shorter than the first joint of the limb, the marsupial plates in all the pairs being fringed with setæ.

Pleopods.—Peduncles of the first pair as usual longer than those of the third pair; the inner ramus of the first pair with seventeen joints, outer with twenty-two; inner ramus of the third pair with nineteen joints, outer with twenty-three. First joint of the inner ramus of the first pair with nine feathered setæ below the cleft spine, of the third pair with seven such setæ; the first joint of the outer ramus in the third pair having fifteen plumose setæ along its outer margin.

Uropods scarcely differing from those of *Lanceola pacifica*.

Telson in general appearance like that of *Lanceola pacifica*, a very little longer than the peduncles of the third uropods, and having the lower part of the lateral margins and the apex not minutely pectinate as in the species just mentioned, but by comparison boldly serrate with teeth, of which some are bifid.

Length, about one inch, the antennæ not included.

Locality.—Station 334, March 14, 1876; lat. 35° 45′ S., long. 18° 31′ W.; 1915 fathoms. Trawled. One specimen, female.

Remarks.—Had no other species been described than *Lanceola pelagica*, Say, from the Gulf Stream, there could have been no difficulty in assigning that name to the present form, but the locality is more suggestive of *Lanceola felina*, Bovallius, from Tristan da Cunha; in that species, however, the telson appears to be shorter than the peduncles of the third uropods. From *Lanceola sayana*, Bovallius, an Atlantic species, as well as from the Pacific species, *Lanceola pacifica*, it is separated to all appearance only by minute differences.

Lanceola sp.

Length a little over half an inch.

Locality.—Station 297, November 11, 1875, South Pacific; lat. 37° 29′ S., long. 83° 7′ W.; depth, 1775 fathoms; bottom, Globigerina ooze; bottom temperature, 35°·5; surface temperature, 57°. Tow-net at trawl. One specimen.

Remarks.—This specimen was mounted in a cell on the voyage, apparently in

glycerine. The second, third, and fourth segments are the longest and by far stouter than those which follow. The segments are imbricated. The relative lengths of the legs do not seem to differ very strikingly from those of the species just described. The telson, so far as appears in the undissected specimen, is a little more than half the length of the peduncles of the third uropods.

Lanceola sp.

The specimen here figured has not passed through my hands. The woodcuts represent two drawings by the late v. Willemoes Suhm, who appended the following notes:—

"Fig. 2. Amphipod. × 2, etwas mehr.

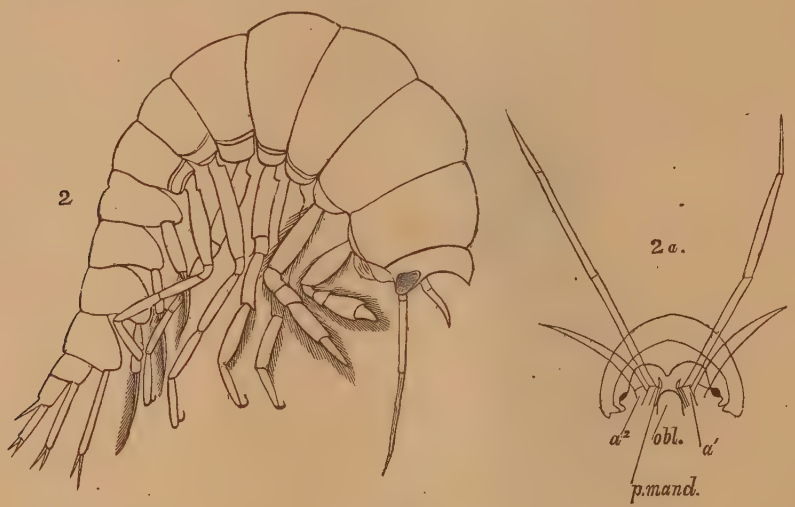

Fig. 27.

"Augen fehlen. Rothe Pigmentflecken ca. 1½ mm. im Dchm. am ersten Ring. Maxillipedtaster fehlen. Länge von Schwanz-Ende bis zur Spitze 2ten Segm. 42 mm.

"Fig. 2*a*. Starker Vergrösserung des Kopfes von vorn. Augen keine hervorragende Platte sondern eine etwas deprimirte pigmentirte Stelle, wohl ganz ohne opt. Apparat.

"Von No. 194, 29 Sept. 74, off Banda Isl., 360 fs."[1]

Fig. 2*a* is reduced to half the size of the original drawing. Fig. 2 is a facsimile of the original. So far as can be judged from the measurements given, the total length of the specimen was about two inches. It is probably to this specimen that Pagenstecher refers (see Note, 1879, p. 497) in the words, "Eine Hyperide von 7 cm. nur mit rothen Pigmentflecken statt der Augen in grossen Tiefen der Arúsee." But "7 cm." is the measurement of the figure from the rostrum to the apex of the third uropods, and the

[1] Compare the description of *Erythrocephalus cæcus*, Tilesius, quoted at p. 109.

figure represents the specimen in a bent position, magnified to rather more than twice the natural size. Pagenstecher does not give any reference to the source of his information, but it was no doubt obtained in one way or another from the notes of v. Willemoes Suhm himself. The statement that eyes are wanting must be received with reserve. "The red pigment-spots about $1\frac{1}{2}$ mm. in diameter on the first segment," that is on the head, as shown in the figures, correspond in size and position with the eyes as usually met with in this genus, and the crystal cones being in any case few and minute might easily be overlooked by any one unacquainted with the genus but accustomed to the multitudinous ocelli commonly found in the Hyperina. In fig. 2*a*, a^1 indicates the lower antennæ, a^2 the upper, *obl.* the epistome or Oberlippe.

Lanceola æstiva, n. sp. (Pl. CLIII.).

Head rather short but very deep, with a very small triangular rostrum; the lateral margin irregular, the front of the head large and flat, with a central carina running between the antennæ which project above the mouth-organs; the central dorsal line of the whole animal scarcely carinate though the back is angled both here and laterally; the first three segments of the pleon with numerous spines or setæ round the convex lower margins.

Eyes doubtful, seemingly minute, prominent.

Upper Antennæ.—The peduncle of three short joints, the second and third successively shorter; the flagellum with its first joint broad, curved, very long, narrow near the base, acute at the tip, its three edges serrate, the convex upper one closely so; just within the apex there is a minute second joint, an apical third joint having probably been broken off.

Lower Antennæ.—Second joint short, with well-pronounced decurrent gland-cone; third joint about three times as long as the second, slightly bent, with three edges; the fourth joint elongate, longer than the whole of the upper antennæ, three-edged, the upper margin minutely serrate; the fifth joint scarcely so long as the fourth, much more slender, at first three-sided, then laminar, strongly tapering, its upper edge finely ciliated; the slender apex divided into two or perhaps three little joints.

Epistome prominent, helmet-shaped.

Upper Lip with the outer plate apically deeply cleft, the inner plate much shorter, transversely oval.

Mandibles similar in structure to those of *Lanceola pacifica*, the triangular secondary plate of the left mandible a little serrate on the edges, the groove or ridge over the spinous region strongly developed, convex; the palp much longer than the trunk, the first joint short, distally widened, the second joint very long with several slender setæ or setiform spines on three edges of the slightly widened distal part; the third joint long

and slender, two-thirds the length of the second, tapering to a point, the outward facing margin closely furred with spinules or setules.

Lower Lip.—The two oval pieces which represent at once the principal lobes and the mandibular processes, are ridged longitudinally; the long footstalks on which they appear to be supported form the lower border of the wide mouth-opening; between these in the figure *l.i.* are seen portions of the mouth cavity itself, a broad line of cilia running right round.

First Maxillæ.—The inner plate very broad, broadest distally, the distal margin nearly straight, this and the surface near it thickly set with spines and cilia which pass along the rounded corners and some way along the outer and inner margins; the outer plate as in *Lanceola pacifica*, the five distal spines similarly arranged and with similar proportions; the palp a little broader and longer than the outer plate, a ridge on its inner surface attaching it to the outer plate near the middle of the base, its own inner margin turned outwards, fringed with twelve minute distant spine-teeth, its convex outline becoming concave between the two distal spine-teeth, the apex blunt, partially serrulate, with a small spine just below it on the outer margin, this margin facing inwards, pectinate with minute spines for scarcely a third of its length from the apex, then smooth.

Second Maxillæ.—The bases broad, the plates long and narrow, on one surface distinct, on the other surface having their bases completely coalesced; the inner plate shorter than the outer, more or less channelled on the outer edge, distally strongly furred with spine-like cilia and carrying twelve long spines; the outer plate ciliated in a similar manner, and carrying ten long spines in two rows. Each pair of plates is in this genus widely separated from the fellow pair.

Maxillipeds.—Inner plate prominent, forming a sort of triangle, decidedly cleft halfway down from the apex, perhaps below this having a suture; the outer margins some way down from the apices fringed with a fur of spinules; the outer plates prismatic, twice as long as broad, with half a dozen little spine-teeth spaced along the inner margin of the outer surface and three closer together on the apical slope; the second inner margin has about eighteen slender slightly feathered spines, most of them very long; the distal part of the outer margin is serrate and carries four spines; the outer surface is armed with twenty or more spines; the base carries numerous slender spines on the outer margin and outer surface, and from the centre of its distal margin rises a thin somewhat triangular plate, of which the apex is somewhat rounded and minutely pectinate, with a minute central emargination.

First Gnathopods.—Side-plates broad and shallow, with sinuous lower border. The first joint narrowest at the neck, very broad, as long as the four following joints together, the outer front margin convex, smooth, the inner fringed with long setæ, the convex hinder margin fringed with slender setiform spines; the short second joint with

three such spines at the apex behind, and three or four on the outer surface; the third joint with the serrate hinder and distal margins fringed with spines; the wrist as broad as the first joint, a little longer than broad, with spines along the convex front margin and the parallel ridge and the shorter hind margin, and thickly set on the inner surface of the sinuous distal margin, either end of which is rounded and serrate; the hand much shorter than the wrist, scarcely half as broad, narrowing to a slightly emarginate apex, the margins slightly serrate, the hinder nearly straight, finely pectinate, both fringed with spines; the inner surface having about thirty flexible spines distributed over it; the finger nearly straight, slender, more than half the length of the hand, its inner margin a little pectinate.

Second Gnathopods.—Side-plates similar to the first pair. Branchial vesicles oval, about half as long but not nearly half as broad as the marsupial plates. The marsupial plates are similar in appearance to branchial vesicles, much broader than the first joint, but not half its length, smooth, without setæ, of which, however, the eventual production is perhaps indicated by markings round the margin. The first joint longer than that of the first gnathopods, but less broad, not quite so long as the wrist and hand together, with some slender spines along the front margin, the adjoining ridge without spines, the hind margin with a few; the second joint with some spinules on the hind margin; the third joint shaped as in the preceding pair, but with fewer spines; the wrist elongate, widening a little distally, with six small spines on the front margin, two on the straight hind margin, and about ten on the distal margin; the outer surface has two longitudinal ridges, of which the hinder carries a few spinules; the hand elongate, narrower and shorter than the wrist, tapering to an emarginate apex, with eight spinules along the front margin, the outer surface with two slight ridges, the inner carrying about a dozen small spines; the finger slender, not a third the length of the hand.

First Peræopods.—Side-plates broad and shallow, like the preceding pairs narrow in front. Branchial vesicles like the preceding pair. The marsupial plates larger than the preceding pair. The outstretched limb two-thirds of an inch long. The first joint longer than in the preceding limbs, with about twenty-four spines along the hind margin, fewer on the front, the adjoining ridge unspined; the second joint longer than broad, without spines; the third joint longer than the fourth, shorter than the fifth, with small spines along three edges; the fourth joint with spines along both margins, and a row along the under surface, the two longitudinal ridges of the upper surface without spines; the fifth joint narrower, gently curved and tapering, with two ridges along the upper, and one along the under surface, the concave hinder margin carrying about twenty-seven minute spines, and the inner surface a row of fewer spines; the finger slightly bulbous at the base, slender, a little curved, about a seventh part of the length of the fifth joint.

Second Peræopods similar to the first, but with the side-plates larger, the branchial vesicles very much larger, equal to or exceeding the size of the marsupial plates, and the

joints of the limb, except perhaps the finger, longer; the third and the fifth joints are subequal in length; the outstretched limb rather more than seven-tenths of an inch long.

Third Peræopods.—Side-plates broad and shallow, especially in front. Branchial vesicles and marsupial plates like the preceding pair. First, third, and fourth joints longer but less broad than in the second peræopods, the structure in general similar; the fifth joint shorter than in the preceding pair, shorter than the fourth joint, straight, little narrowed distally, apically produced in a narrow lobe behind the finger; the finger extremely narrow except at the base, very small and strongly bent upwards, without teeth on the inner margin; the outstretched limb three-quarters of an inch long.

Fourth Peræopods.—Side-plates not narrowly produced forwards like the preceding pairs, the front lobe the smaller, the hinder produced downwards at the back in a small point. Branchial vesicles large, the oval rather abruptly narrowed some distance above the apex. The outstretched limb more than an inch long; the long first joint has a folding in of the hind margin near the base, fringed with spines; the front margin and the longitudinal ridge of the upper surface near the hind margin carry small spines; the third joint is intermediate in length between the first and fourth, the fifth joint is rather longer than the first, the armature of all these both on margins and ridges being very inconspicuous; the retractile finger is very small, strongly bent, narrowing rapidly from the base to the bend, the inner margin fringed with minute teeth, of which those near the base are inclined backward.

Fifth Peræopods.—Side-plates not very broad. The outstretched limb over two-fifths of an inch; the first joint longer than the following three together, with fifteen spines along the front margin, and nine or ten on the hind margin, the three ridges smooth; the third joint longer than the fourth, shorter than the fifth, which is not so long as the first joint; the finger as in the fourth peræopods.

The relative proportions of the peræopods may be represented by the numbers 80, 86, 90, 122, 50.

Pleopods.—The two slender coupling spines have each on either margin three or four retroverted teeth below those of the apex; the cleft spine nearly as in *Lanceola pacifica;* the rami are about equal in length, but in the pair examined there are on the somewhat stouter inner ramus only fifteen joints, and eighteen on the outer; the long first joint of the inner ramus has eight feathered setæ on its inner margin below the cleft spine; and on the outer margin of the first joint of the outer ramus the setæ are also numerous.

Uropods very similar in character to those of *Lanceola pacifica,* but the rami of the second pair do not exceed in breadth those of the first pair, or scarcely so, the peduncles of the third pair are less unequal to those of the second pair, and the inner ramus of the third pair is not noticeably shorter than the inner ramus in either of the other pairs.

Telson triangular, about once and a half as long as the breadth at the base, not

nearly as long as the peduncles of the third uropods, but more than half as long, just at the apex in our specimen microscopically and irregularly serrate or notched.

Length.—The length in a straight line from the rostrum to the apex of the third uropods was an inch and two-fifths. The animal when it reached me was broken in two.

Locality.—Station 120; lat. 8° 37′ S., long. 34° 28′ W.; depth, 675 fathoms; bottom, red mud; surface temperature, 78°. One specimen, trawled.

Remarks.—This appears to be the first species of the genus that has been taken within the tropics, and the specific name refers to the surface temperature of its habitat. The specimen, besides being broken, could not in other respects be described as well set up, but the animals of this genus seem liable to present themselves in a dilapidated condition, their integument probably being very little crustaceous. The species comes near to the briefly described *Lanceola felina*, Bovallius, from Tristan da Cunha.

A second specimen, in poor condition, appears to belong to this species.

Telson scarcely half as long as the peduncles of the third uropods.

Length, without the antennæ, three-fifths of an inch.

Locality.—Station 106; lat. 1° 47′ N., long. 24° 26′ W.; depth, 1850 fathoms; bottom, Globigerina ooze; bottom temperature, 36°·6; surface temperature, 78°·8.

Lanceola suhmi, n. sp.

Rostrum blunt; the second, third, and fourth segments of the peræon the longest, transversely ridged down the sides, the central dorsal line seeming more or less angled from the rostrum to the extremity of the telson, at either end of the animal only faintly, but on the last three segments of the peræon and the first four of the pleon forming a carina, distally produced into a tooth, which on the pleon-segments just mentioned is very pronounced.

Eyes very small according to the figure by v. Willemoes Suhm.

Upper Antennæ.—The three joints of the peduncle very short, the long first joint of the flagellum broad, tapering, curved, strongly ridged below, without any brush of filaments, rather longer than the last joint of the lower antennæ, succeeded by three minute joints, the last of which is acute.

Lower Antennæ.—Fourth joint very long, slightly curved, almost laminar, though a little ridged below, the fifth joint considerably shorter, yet long, straight, tapering to a point, almost laminar.

Mouth Organs (so far as could be seen without dissection and in their dry hard condition) similar to those of *Lanceola pacifica*. As the animal was figured during the voyage, it may be presumed that it had at some period been allowed to become dry, an experience from which the more delicate organs of an Amphipod seldom entirely recover.

First Gnathopods similar to those of *Lanceola æstiva*, but the first joint, the wrist and the hand less broad, the spines on the hind margin of the wrist differently arranged, and the wrist carrying on its outer surface a second ridge with a few spines near to the hind margin; the spines on the margins and inner surface as numerous as in the species just named.

Second Gnathopods similar to those of *Lanceola æstiva*, but one ridge of the tapering hand set closely with spines, the hand and finger together not so long as the wrist.

Second Peræopods a little longer than the first, the full length thirteen-twentieths of an inch, the first joint not quite so long as the third and fourth together, the third longer than the fourth, nearly as long as the fifth, these three joints having two ridges along the outer surface, the hinder one in all three and both in the fifth joint carrying small spines, which is also the case with the two margins, but the spines are much more numerous on the hind than on the front margin.

Third Peræopods.—The full length sixteen-twentieths of an inch, the first joint the longest, but not greatly longer than the third; the third longer than the fourth, the fourth than the fifth; the fifth, which like the four preceding joints has two longitudinal ridges on the outer surfaces, is not strongly spined, slightly curved, and a little narrowed towards the apex, this not being very strongly or broadly produced behind the small retractile finger.

Fourth Peræopods very similar to the preceding pair, but broader, almost unarmed; the full length about nineteen-twentieths of an inch, the excess of length over the preceding pair being chiefly in the first and fifth joints, but more especially in the fifth.

Fifth Peræopods.—The full length half an inch, the joints ridged as in the preceding pairs, the first joint the longest, the third longer than the fourth, the fifth intermediate between the first and the third, the produced apex narrow; the finger very small, bent, the inner margin without teeth in our specimen.

Pleopods.—Inner ramus in the first pair with sixteen joints, the outer with twenty.

Uropods closely resembling those of *Lanceola æstiva*, although here it appears as if the outer ramus were the longer both in the first and second pairs, and the peduncles are rather more sharply produced at the inner apical angle, especially in the third pair.

Telson long and narrow, very nearly equal in length to the peduncles of the third uropods, triangular, with the sides smooth for some distance from the base, then finely but not closely serrate or irregularly denticulate, the apparently acute apex also being seen under a high power to be cut into a fringe of four tiny teeth.

Length about an inch from the rostrum to the end of the uropods, the head and peræon measuring half an inch, the pleon-segments one-third, and from the base of the telson to the extremity of the uropods nearly one-fifth of an inch.

Locality.—Station 50, off Nova Scotia; lat. 42° 8′ N., long. 63° 39′ W.; depth, 1250fathoms.

Remarks.—The name is given in honour of the deceased naturalist, v. Willemoes Suhm, who during the voyage made the rough sketch, here reproduced, of this interesting animal. The drawing is said to be magnified to double the size of the specimen, but seems to be rather in excess of that. The species appears to come near to *Lanceola*

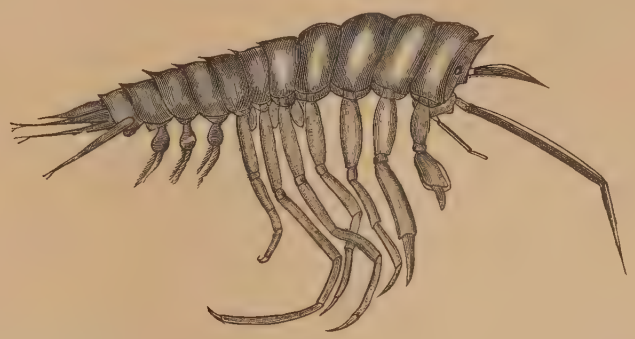

Fig. 28.—*Lanceola suhmi*, n. sp., from a drawing by the late Dr. R. v. Willemoes Suhm.

serrata, Bovallius, "from the mouth of Davis Strait," but in that species the pleon is said to be shorter than half the peræon with the head, and the segments of the peræon are said to be smooth, only the segments of the pleon being mentioned as forming a serrated keel.

Lanceola australis, n. sp.

Head forming an obtuse angle in front, without rostrum; the whole dorsal line of the animal angled; the seventh segment of the peræon has the dorsal line produced backwards in a very small tooth; each of the first three segments of the pleon has a similar but rather larger tooth.

Eyes very small, projecting a little from the surface of the head.

Upper Antennæ as in *Lanceola æstiva*, but with the large flagellum joint more strongly curved.

Lower Antennæ similar to those of *Lanceola æstiva*, but showing no minute apical joints.

Mandibles not very different from those of *Lanceola æstiva;* the tooth on the lower margin behind the cutting edge very minute; the inner groove or ridge extending with sinuous outline from the rear of the cutting plates for almost the whole length of the trunk; the second joint of the palp without setæ at the distal end, not very much longer than the third joint.

Second Maxillæ.—The plates long and narrow, the inner a little shorter and considerably narrower than the outer.

Gnathopods agreeing very nearly with those of *Lanceola æstiva;* the wrist in the first pair less dilated, with the front margin less convex.

Peræopods.—The *First* and *Second* a little under half an inch, the *Third* nearly three-fifths of an inch, the *Fourth* three-quarters of an inch, the *Fifth* one-third of an inch long; the relative proportions may be represented by the numbers 54, 56, 69, 90, 40. In the *Third Peræopods* the fifth joint is longer than in the preceding pair, and not shorter than the fourth joint, differing in these respects from the proportions found in *Lanceola æstiva.*

Uropods differing little from those of *Lanceola æstiva*, except that the peduncles of the second and third pairs are narrower, with the inner apices more acutely produced.

Telson long and narrow, about two and a half times as long as the greatest breadth, not quite reaching the bases of the rami of the third uropods, the central dorsal line angled for a short distance from the base, the apex almost acute, the sides being a little serrate near the apex.

Length, without the antennæ, about nine-tenths of an inch.

Locality.—Station 158, in the Southern Ocean, March 7, 1874; lat. 50° 1′ S., long. 123° 4′ E.; 1800 fathoms; bottom, Globigerina ooze; bottom temperature, 33°·5; surface temperature, 45°. One specimen.

Remarks.—The specific name refers to the place of capture, which makes it improbable that this species should be the same as the large *Lanceola serrata*, Bovallius, from "the mouth of Davis Strait," in which, moreover, "the dorsal side of pereion is smooth." In *Lanceola suhmi*, another North Atlantic species, the dorsal teeth are more numerous and larger than in the present species, and in the third peræopods the fifth joint is not longer than in the preceding pair and is shorter than the fourth joint.

The following table will show at a glance the remarkable distribution of the genus *Lanceola*, as illustrated by the eight specimens of the Challenger collection :—

1. Station 50; lat. 42° 8′ N., long. 63° 39′ W.; depth, 1250 fathoms (*Lanceola suhmi*).
2. Station 106; lat. 1° 47′ N., long. 24° 26′ W.; depth, 1850 fathoms.
3. Station 120; lat. 8° 37′ S., long. 34° 28′ W.; depth, 675 fathoms (*Lanceola æstiva*).
4. Station 334; lat. 35° 45′ S., long. 18° 31′ W.; depth, 1915 fathoms.
5. Station 297; lat. 37° 29′ S., long. 83° 7′ W.; depth, 1775 fathoms.
6. Station 158; lat. 50° 1′ S., long. 123° 4′ E.; depth, 1800 fathoms (*Lanceola australis*).

7. Station 194A; lat. 4° 31′ 0″ S., long. 129° 57′ 20″ E.; depth, 360 fathoms.

8. Station 241; lat. 35° 41′ N., long. 157° 42′ E.; depth, 2300 fathoms (*Lanceola pacifica*).

Thus from west to east the genus may be considered as ranging round the world, while from north to south a range is shown of more than ninety degrees, to which may be added about thirty degrees northward, since *Lanceola clausii*, Bovallius, was taken in "Davis Strait, at lat. 72° N." It is remarkable that each of the Challenger specimens was labelled, not, like most of the Hyperina, with the word "surface," but with the number of fathoms of the particular station, indicating that the specimen was supposed to have come from the great depth mentioned. It may be conjectured that the smallness of the eyes and the soft membranaceous character of the integument are connected with residence in the abysses of the ocean, and the latter character perhaps also with a capacity for passing without injury from the bottom to the surface. The pleopods are well developed, so that the animal may be itself a good swimmer, but, to account for the wide distribution of the genus, it may be supposed that the creature often avails itself of extraneous assistance, the retractile claws of the last three pairs of peræopods being well adapted for giving it a firm hold upon animals of much greater size and speed.

Family Cystisomidæ, von Willemoes Suhm, 1875.

The name Cystisomidæ was proposed for this family by von Willemoes Suhm in the paper read before the Linnean Society on May 7th, 1874. Under the name Thaumatopsidæ, the family was defined by Bovallius in 1886 as follows:—

"Hyperids with large, tumid head. The eyes large, occupying the upper parts of the head. The first pair of antennæ straight or angularly bent, not tumid. The second pair rudimentary. The mandibles without palp. The seventh pair of pereiopoda [*fifth peræopods*] not transformed. The inner ramus of the uropoda coalesced with the peduncle; the peduncles very thick."

In the Systematical List, 1887, Bovallius gives a similar definition, but omitting all notice of the uropoda, and remarking that the second pair of antennæ are rudimentary *in both sexes*. In the Arctic and Antarctic Hyperids of the same year he gives a third definition, as follows:—

"Head and body very large and tumid. Eyes large, occupying the upper sides of the head. First pair of antennæ straight, not tumid, few-jointed. Second pair rudimentary. Mandibles without palp. Seventh pair of pereiopoda [*fifth peræopods*] not transformed. Uropoda very thick, prismatic, with distinct rami."

The description of the uropods as having "distinct rami" is open to misunder-

standing unless taken in connection with the definition of the genus "*Thaumatops*," given in the same work as follows:—

"Head very large, bordered with a serrated crest around the middle. First two pairs of pereiopoda [*First* and *Second Gnathopods*] cheliform. Second pair of uropoda are totally wanting. The interior rami are coalesced in both existing pairs of uropoda."

Genus *Cystisoma*, Guérin-Méneville, 1842.

1842. *Cystisoma*, Guérin-Méneville, Revue zoologique, juillet 1842, p. 214.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 981, 1442.
1862. *Cystosoma*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 311.
1873. *Thaumops*, v. Willemoes Suhm, Proc. Roy. Soc. Lond., vol. xxi. p. 206.
1874. „ v. Willemoes Suhm, Phil. Trans. Roy. Soc. Lond., vol. clxiii. pp. 629, 637.
1874. *Cystosoma*, v. Willemoes Suhm, Nature, vol. ix. p. 182.
1875. *Thaumatops*, von Martens, Zool. Record for 1873, vol. x., Crustacea.
1875. *Cystosoma*, v. Willemoes Suhm, Zeitschr. f. wiss. Zool., Bd. xxv. p. 37.
1875. *Cystisoma*, v. Willemoes Suhm, Trans. Linn. Soc. Lond. (Zool.), ser. 2, vol. i. pt. i. p. 24.
1876. „ v. Willemoes Suhm, Proc. Roy. Soc. Lond., vol. xxiv. p. 570.
1877. *Cystosoma*, Wyville Thomson, The Atlantic, vol. i. p. 129.
1879. „ Pagenstecher, Sammlung gem. wissensch. Vorträge, ser. xiv. Hft. 315, 316, p. 39.
1885. *Cysteosoma*, Bovallius, Mimonectes, A Remarkable Genus of Amph. Hyper., p. 2.
1885. *Cystosoma*, Stebbing, Narr. Chall. Exp., part ii. p. 622.
1886. *Thaumatops*, Bovallius, On the genus Cysteosoma or Thaumatops, Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 9.
1886. *Cystosoma*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 490.
1887. *Thaumatops*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 14.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 557.

For the original definition of the genus *Cystisoma*, see Note on Guérin-Méneville, 1842 (p. 196); this may be compared with the account of the earliest described species, *Oniscus spinosus*, in the Note on J. C. Fabricius, 1775 (p. 40). For the definitions successively given for *Thaumops*, see Notes on v. Willemoes Suhm, 1873 (p. 423), 1874 (p. 440). The definition of the genus under the name *Thaumatops* given by Bovallius in 1887 has been quoted above; in 1886 he defined it as follows:—

"The *body* is hyaline, the segments distinctly separated from one another (except the two first pereional segments of Th. Neptunus and Th. pellucida, which are coalesced). The epimerals are only indicated.

"The *head* is large, more or less rounded, tumid. The *eyes* are large, occupying almost all the upper surface of the head.

"Only the *first pair of antennæ* are developed, straight, few-articulated. The second pair are represented by two small tubercles.

"The *mandibles* are small, rounded, with a molar tubercle, but without palp.

"The second pair of *maxillæ* consist of only one lamina.

"The first and second pairs of pereiopoda [*First* and *Second Gnathopods*] are cheliform, the following [five pairs of *Peræopods*] ending with a claw-shaped dactylus.

"The *uropoda* are very thick, the second pair wanting, the inner rami coalesced with the peduncles."

In the species, however, which have come under my examination, the mandibles are large as compared with the other mouth-organs, and by no means rounded, each has a denticulate cutting edge, the left mandible a denticulate secondary plate, the molar tubercle a long, straight edge set with cilia and minute spine-teeth. The integument of the back appears to be remarkably homogeneous, not as generally in the Gammarina much more flexible and less crustaceous at the folds between each segment, hence I feel some hesitation in adopting as a character of the genus the statement that the first two segments of the peræon are as a rule distinct. The line of coalescence between the two segments being in any case marked by a transverse ridge, a very slight crumpling of the integument behind this ridge would give the same effect of separation as that which in fact marks the division between the following segments.

Cystisoma spinosum, ♂ (J. C. Fabricius) (Pl. CLIV.). Specimen A.

1775. *Oniscus spinosus*, Fabricius, Systema Entomologiæ, p. 298.
1781. „ „ Fabricius, Species Insectorum, t. i. p. 377.
1787. „ „ Fabricius, Mantissa Insectorum, t. i. p. 241.
1788. „ „ Gmelin's Linnæi Systema Naturæ, t. i. pars v. p. 3010.
1793. *Cymothoa spinosa*, Fabricius, Entom. Syst., t. ii. p. 508.
1842. *Cystisoma Neptunus*, Guérin-Méneville, Revue zoologique, juillet 1842, p. 214, pl. i. fig. 1.
1852. „ „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 981, note.
1862. *Cystosoma Neptuni*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 311, pl. l. fig. 7.
1873. *Thaumops pellucida*, v. Willemoes Suhm, Proc. Roy. Soc. Lond., vol. xxi. p. 206.
1874. „ „ v. Willemoes Suhm, Phil. Trans. Roy. Soc. Lond., vol. clxiii. pp. 629, 637, pls. xlix., l.
1874. *Cystosoma neptuni*, v. Willemoes Suhm, Nature, vol. ix. p. 182.
1875. *Cystisoma Neptunus*, v. Willemoes Suhm, Trans. Linn. Soc. Lond., ser. 2, vol. i. pt. i. p. 24, pl. xi. figs. 4–8.
1876. „ „ v. Willemoes Suhm, Proc. Roy. Soc. Lond., vol. xxiv. p. 570,
1877. *Cystosoma neptuni*, Wyville Thomson, The Atlantic, vol. i. p. 129.
1879. „ „ Pagenstecher, Sammlung gem. wissensch. Vorträge, ser. xiv. Hft. 315, 316, p. 39.
1884. *Thaumops pellucida*, Kingsley, The Standard Natural History, vol. ii. fig. 99.
1884. *Cystosoma neptuni*, Kingsley, The Standard Natural History, vol. ii. fig. 101.
1886. *Thaumatops Neptunus*, Bovallius, Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 9, p. 6.

1886. *Thaumatops pellucida*, Bovallius, Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 9, p. 8.
1887. „ *Neptunus*, Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 16.
1887. „ *pellucida*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 16.

Head inflated, wider than any part of the body, longer than the upper antennæ, rather broader than long, the upper surface almost entirely mapped out into minute hexagonal spaces in correspondence with the multitudinous ocelli; the lower surface fringed on either side by a row of thirteen or fourteen denticles, the wide space between these rows being occupied by a thin transparent membrane, from which, on either side of the mouth-organs and for a short space above them, project two short rows of denticles, five in each row, the highest pair of denticles being much the longest, and the next pair longer than the three lowest pairs, the lowest approaching the outer angle of the mandibles. The first two segments of the peræon are coalesced into one, which is rather longer than the next following, the seventh is longer than those which precede it, but shorter than the first segment of the pleon; the segments of the pleon diminish in length successively; in breadth the animal tapers from the base of the head to the telson. The segments are all carinate and centrally dentate, except the small (coalesced) fifth and sixth segments of the pleon. The seventh segment of the peræon and the first three of the pleon have each three teeth along the central ridge, the others have two apiece. The segments of the peræon and some of those of the pleon have the hind margin fringed with minute denticles, the composite first segment of the peræon having also a row near the front corresponding probably with the line of coalescence. The joints of all the limbs are prismatic in transverse section.

Eyes (see description of the female).

Upper Antennæ thirteen-twentieths of an inch in length, the first joint the stoutest, short, two or three times as long as broad, seemingly constituting a one-jointed peduncle, the following joint many times as long, of triangular transverse section, tapering, having on the inner side for most of its length a row of small setules not very closely set and scarcely showing beyond the margin, the apex produced into a small tooth on one side; planted within but projecting beyond the tooth is a small narrow tapering third joint.

Lower Antennæ wanting, unless the foremost pair of ventral denticles may be regarded as rudiments of these organs.

Epistome small, unsymmetrically helmet-shaped. In the upper figure of the mouth organs the epistome and upper lip are at the top, the maxillipeds at the bottom, the mandibles projecting on either side; the palps of the first maxillæ meet just over the emargination of the upper lip; the second maxillæ are crossed by the outer plates of the maxillipeds. In the lower figure, the maxillæ and maxillipeds having been removed, the

lower lip and the distal emargination of the upper lip come into view, with the cutting edges and molar tubercles of the mandibles lying under and between them; the trunks of the mandibles being partially released from their attachment are here more widely displayed than in the upper figure.

Upper Lip broader than the epistome, broader than deep, smooth-edged, unsymmetrically bilobed, the cleft in the distal margin being narrow and not very deep.

Mandibles.—The cutting edge narrow, with nine teeth on the right mandible and perhaps one or two more on the left; the lowest tooth in each recedes behind the line of the others, and behind and below it there is a tuft of cilia-like spines, the lower margin beyond being smooth; the secondary plate on the left mandible is quite narrow at the base, but widens out till its distal margin, which is cut into thirteen denticles, is about as wide as that of the principal plate, the edges so closely overlapping that it is not very easy to distinguish the teeth of the one from those of the other; the molar tubercle on each mandible large, with a very long, straight front edge, which is closely ciliated, and carries a row of small projecting teeth or spine-teeth, not quite closely set, more than fifty in number, besides several other rows of smaller teeth; the trunk of the mandible is large, the lower margin forming an obtuse angle at some distance behind the molar tubercle, while some distance further back the extremity of the mandibles forms an acute angle, the long comparatively straight upper margin having in advance of the centre a small triangular process with a broad base extending backwards, this process possibly representing a rudiment of the palp.

Lower Lip.—The outer and inner lobes coalesced, though distinguished by a strong ridge or suture, both dehiscent, the inner a little less than the outer, the inner margin of the outer lobes slightly hairy, that of the inner lobes strongly ciliated; the mandibular processes apically rounded, not divergent.

First Maxillæ.—The inner plate appears to be a smooth thin expansion surmounting the short first joint, but scarcely prominent beyond the inner margin of the long second joint; the outer plate short and broad; some way up on its sinuous inner margin a series of setiform spines begins, which is continuous right round the very broad distal margin, but there is also a series of stronger spines, on the distal part of the inner margin three that are rather narrow, followed by six stronger, a weak one, a strong one, two weak ones, and then a mixed group, in which there are three or four especially large and strong; the single-jointed palp is not so broad as the outer plate, but is rather longer, with some very minute spine-teeth on the inner margin, the apical margin being cut into many very acute little teeth, some still smaller teeth descending a part of the convex outer margin.

Second Maxillæ.—Basal part broad, beyond the centre abruptly contracting on the inner side, the inner margin then running smoothly and almost straight to the apex, but within this margin, before the apex is reached, there is a small linear projection,

distally scabrous, which perhaps represents in rudiment the inner plate of the maxilla; beyond this there are two or three prickles and a very small spine tooth, which is followed by the sharply double-pointed apex, whence fifteen or sixteen small acute teeth descend the convex outer margin, gradually weakening into faint serrations, all the lower part of the margin being smooth.

Maxillipeds.—The first joint, which in the separate figure *mxp* is for the sake of distinctness unfolded, in its natural position is bent at a sharp angle to the second joint, so that when the maxillipeds are separated from the head, the first and second joints naturally close together; the inner plate strongly prismatic, one edge centrally projecting inwards, this edge starting some way below the distal margin of the second joint; at its apex there is a small interval between the concave distal margins of the two sides, each of which carries two small separated spine-teeth near the inner and lower end; the front of the plate also has a concave distal margin, with a small central emargination and two or three little spine-teeth spaced along the slightly serrate margin on either side of this; the outer surface of the plate is not distinctly marked off from that of the second joint, except that in the centre of what may be considered as its base-line, there is a small conical tooth; on either side of this are planted the two outer plates, which after widening a little from their bases, narrow to an acute apex; the outer margin is smoothly convex, the inner carries two spinules at intervals not far from the base, and then is cut into strongly marked teeth as follows, a very small, a larger, a larger still, a rather small, a very large, a less large, a rather small, a large, a small, a moderately large, the apical largest of all, with a small tooth on its inner side; the two plates, however, are not symmetrical, since that on the right hand in place of the twelve teeth just mentioned has but ten, the first of them, however, being a double tooth.

First Gnathopods.—The side-plate represented by an outward projecting tooth. The limb about eight-twentieths of an inch long, the first joint as long as the next four together, widening a little distally for the strong muscles which are grouped in the distal portion; the front margin having on one gnathopod six strong teeth and three small ones, on the other having eight less unequal teeth; the hind margin is nearly smooth, but the apex is produced into a sharp tooth, and above this there are on one gnathopod two, on the other three, small teeth and a spinule; the second joint much broader than the length of its front, apically produced behind in a strong tooth, at the base of which there is a very small tooth on the hind margin; the third joint longer than broad, clasping the wrist, with scarcely any free front margin, the surfaces carrying some slender spines, of which there are some on the more or less deeply emarginate apex, and on one gnathopod one on the otherwise smooth hind margin, while the other gnathopod has three; the wrist with the front margin longer than the hand, apically forming a small tooth, otherwise smooth, triangularly produced behind almost to the extremity of the long apical tooth of the hand; on the outer surface

there is near the front apex a strong tooth-like spine, and several smaller ones elsewhere besides some setiform spines, of which there are very many on the inner surface of both wrist and hand; the produced part of the wrist has its margins cut into strong teeth, much of the tooth-margins being also pectinately denticulate; on one gnathopod the margin facing the hand has six teeth and the other margin six, the large apical tooth making the thirteenth; on the other gnathopod the margin facing the hand has seven teeth, and the other margin four; the hand is oblong, about twice as long as broad, the front rather thick with two lines of teeth, each comprising from six to eight, not exactly alike in the two gnathopods, but each line in both gnathopods ending with a strongly produced apical tooth; the hinder margin is cut into seven or eight unequal teeth with partially denticulate margin, and there is a similar tooth on the distal margin; the surfaces of the hand are armed like those of the wrist; the finger is rather more than half the full length of the hand, broad at the base, apically curved and acute, reaching, when bent at a right angle to the hand, beyond the apical teeth of the wrist, its inner margin forming a very small spined tooth, much nearer the hinge than the apex, with two or three little spines or denticles between it and the hinge.

Second Gnathopods in general structure like the first. Side-plate represented by a rather stronger spine-tooth than that of the preceding segment. Branchial vesicles consisting of two subequal oval lobes united at the base, a little longer than the third joint. Limb about eleven-twentieths of an inch long, the first joint rather longer than the four following together, with one front edge smooth, the other carrying eight strong teeth, which on one of the gnathopods are supplemented by two small ones, the hinder margin having six teeth, one being the produced apex; the second and third joints nearly as in the first gnathopods, but larger, and the third with the slender spines more numerous; the wrist and hand similar but much more elongate; the wrist has the margin facing the hand cut into eleven denticulate teeth, and the hind margin in one gnathopod into ten, in the other into seven, such teeth, in addition to the long apical tooth; the hand, which is fully three times as long as broad, has the hind margin cut into twelve teeth, and the front margins much as in the first gnathopods, the inner surface with fewer setiform spines; the finger is longer than in the first gnathopods, but with its inner margin similarly armed.

First Peræopods.—Branchial vesicles about three-twentieths of an inch long, consisting of one very small lobe and a large one of the length mentioned. Limb about an inch and three-tenths in length, the first joint nine-twentieths of an inch long, with nine prominent teeth along the hind margin, and about as many small ones on one edge of the thickened front; the short second joint has three teeth along the hind margin, of these the apical being the longest; the third has fifteen larger and smaller teeth on the hind margin; the fourth which is a little longer has fifteen or sixteen; the rather longer but much narrower fifth joint has about thirty minute teeth, the margin in the intervals

as in the preceding joint being finely pectinate; the three last-mentioned joints have on the surface several transverse rows of slender setæ, which, when the animal is in liquid, stand out on either side and give a feathered appearance to the limb; these setæ are numerous at the apex of the fourth joint; the finger is short and slender. In the figure the first two pairs of peræopods are represented facing forwards, as they happened to be in the specimen, but these long slender appendages sway about in all directions, and the normal position of the limbs is, therefore, assumed in the use of the terms—front margin and hind margin—in the description.

Second Peræopods.—Branchial vesicles simple, much larger than the preceding pair, four-tenths of an inch long. Limb two inches long; first joint nearly as long as the third and fourth together, fourth a little longer than the third, fifth decidedly longer than the fourth, narrowed at the apex, armed as in the preceding pair, the distal part carrying a line of gland-cells; finger small, acute or almost so, a little curved.

Third Peræopods.—Branchial vesicles rather larger than the preceding pair. Limb all but three inches long; the first joint the longest, the second very short, the fourth longer than the third, and the fifth than the fourth, the slender fifth joint not much shorter than the first; the first, third, and fourth joints serrate or dentate on three edges, the fifth along the front margin; the fifth joint distally having a line of gland-cells; the finger small.

Fourth Peræopods.—Branchial vesicles rather larger than the preceding pair. The limb nearly two inches and a half long, the armature and relative lengths of the joints nearly as in the preceding pair.

Fifth Peræopods.—Limb an inch and two-tenths long; the first joint wider above than below instead of the reverse as in the other limbs, as long as the third and fourth joints together, the fourth scarcely longer than the third; the fifth longer than the fourth, narrowest at the base, not narrowing distally, except where the finger is hinged, behind which on either side it is produced into a little sharp spinous process, while in front the distal end of the joint forms a kind of short oblique palm-margin with four distant teeth; the small finger is slightly bent, comparatively thick for the first half, the remainder narrow, acute; the inner margin of the thick part has a minute denticle. In these and in the first and fourth peræopods, gland-cells probably occur at the distal end of the fifth joint, but they were not distinctly observed.

Pleopods.—The first pair about half an inch long, the peduncles rather shorter than the rami; the coupling spines minute, with narrow apex and six or eight retroverted teeth on each margin; there is no cleft spine, but the long and large first joint of the inner ramus carries numerous feathered setæ, in the first pair having as many as twenty-four on the inner margin; the outer ramus has twenty-seven setæ along the outer margin of the first joint; the joints of the inner ramus in the first pair are twenty-one, of the slightly longer but narrower outer ramus twenty-four.

Uropods.—The first pair eight-tenths of an inch long, strongly but irregularly toothed along three margins, the outer margin being also pectinate, the coalesced inner ramus broader but very little longer than the outer, its inner edge strongly toothed all along and pectinate near the acute apex, the ridge more lightly toothed, the outer margin not toothed but pectinate, except at the neck; the outer ramus one-fifth of an inch long, with the inner margin pectinate, of the other two, one toothed, the other scarcely toothed but pectinate; the second pair similar to the first, but a little shorter, yet reaching a little further back, seven-tenths of an inch long, the outer margin of the coalesced inner ramus having two teeth near the neck, besides being pectinate, the outer ramus as long as in the first pair.

Telson very small.

Length, without including the antennæ, four inches and one-eighth, the head over an inch long, the peræon an inch and four-tenths, the pleon an inch and nearly three-tenths, the last uropods seven-tenths, the sum total of the parts rather exceeding the entire length of the animal, since there is a certain amount of overlapping.

Locality.—Station 107, south-west of Sierra Leone, August 26, 1873; lat. 1° 22′ N., long. 26° 36′ W.; depth, 1500 fathoms; bottom, Globigerina ooze; bottom temperature, 37°·9; surface temperature, 78°·8. One specimen, male. Trawled.

Cystisoma spinosum, ♀ (J. C. Fabricius), 1775 (Pl. CLV.). Specimen B.

The Head and general appearance of the animal as in the male; the dentation of the central keel apparently not differing from that in the male.

Eyes.—In his original description of the present specimen, von Willemoes Suhm observes,[1] "the upper surface of the head is entirely occupied by two contiguous faceted eyes, which are separated from one another by a mesial line, 20 millims. in length (Plate XLIX. figs. 2 & 3). Each eye is 13 millims. in width, and its anterior and lateral borders are limited by a slightly coloured band, which will be referred to when considering the structure of the eyes. The posterior border nearly corresponds with the posterior border of the head, which arches gently over to the first segment of the thoracic region." Further on he says,—"The Eyes are contiguous, the line separating them being, however, clearly visible: the length of this line is 20 millims. The eyes thus occupy a rectangular space, the outer edges of which are separated from the spiny borders of the head-shield by a space 6 millims. in width. At the front of the head there is a space of 3 millims. between their anterior borders and the line into which the two antennæ are inserted. Along the sides of the eyes there is a brownish line produced by elongated chitinous appendages, 0·140 millim. long. (Plate L. fig. 8),

[1] *Phil. Trans.*, vol. clxiii. pp. 629, 631.

attached irregularly to the borders of the cornea. These appendages are hollow tubes pointed and closed at the top, and flattened and slightly denticulated at the base. The cornea of the eye is faceted externally, the facets being hexagonal (Plate L. fig. 7). Beneath the facets we find very elegant slender crystalline bodies, 0·840 millim. long, and at the top 0·147 millim. broad (Plate L. figs. 9, 9*a*). I have figured two pairs of these, as they are always united together by their slender ends, the point of union being shown at fig. 9*a*. In their upper part a granulation is to be seen, giving them a slightly brownish colour; and in their tapering extremities there are some clear vesicles, which have some resemblance to the varicosities of a nerve-fibre. The nerve-ends which are present in *Phronima* are absent in this form, and there is no pigment."

In regard to the figures of the ocelli, it may be remarked that their tapering extremities should have been drawn straight, not sinuous; at least I believe that they only assume the serpentine form when detached. The hinder margin of the eyes is not straight, as implied in the above description and as figured in the Plate referred to, but each eye has a curved hind margin, which leaves a small triangular space at the back of the head dividing one eye from the other.

Upper Antennæ.—Of these von Willemoes Suhm says,[1]—"At the frontal border, separated by a distance of about 7 millims., there are two antennæ 26 millims. long. The antennæ consist of two elements, of which the proximal is longer than the distal, which is enlarged at the end, and bears a very small recurved claw." These antennæ are therefore longer than the head, instead of shorter as in the male. Unfortunately when the specimen came into my hands the ends of the antennæ were broken and the tips were gone, but from the portions remaining I feel tolerably sure that the articulation of these antennæ has been misinterpreted; the first joint is short as in the male and evidently represents the peduncle, the "recurved claw" is no doubt equivalent to the little terminal joint in the male, while the elongated intermediate joint had, owing to an accidental fracture, assumed the appearance of two joints, one "angulated" upon the other. The appearance of jointing produced by fracture is not uncommon in the limbs of animals belonging to this genus.

Mouth Organs closely resembling those of the male.

Mandibles.—The lowest tooth of the cutting edge is a little more drawn back on the left mandible than in the male specimen; the triangular process on the upper margin of the trunk is more slender.

First Maxillæ.—The distal spines of the outer plate are not in precisely the same arrangement as in the male specimen; thus, the two large spines nearest to the outer group are cleft for more than half their length; but the force of minute differences of detail of this kind is destroyed by the fact already noticed, that in the maxillipeds of the male specimen the two sides are unlike in just such details.

[1] *Loc. cit.*, p. 630.

Second Maxillæ.—On the distal curve of the widest part of the plate, just before its abrupt contraction, there are four little spines. In the male this part of the margin was broken, and probably for that reason no such spines were seen.

Maxillipeds.—The lateral margins of the distal triangle of the inner plate have each three instead of two small spaced spines.

First Gnathopods.—An elongate outward projecting tooth representing the side-plate. First joint about as long as the next four together, with eight unequal teeth along the front margin, one at the apex of the hind margin, and another a little higher up; a long tooth at the hinder apex of the second joint, and a small one higher up; the third joint also nearly as in the male; one front edge of the wrist cut into five large teeth, its triangular process not quite reaching to the extremity of the hand, the margin facing the hand cut into nine teeth, the hind margin into four, the apical making a fourteenth tooth; the hand with the hind margin cut into eight teeth, besides one on the palmar margin; of the two front margins one has seven, the other eight teeth, besides the large apical tooth of each; the finger as in the male.

Second Gnathopods only differing from those of the male specimen in trifling details, as is also the case with the first gnathopods.

Peræopods of the first, second, third, and fourth pairs not materially differing in appearance from those of the male specimen, not exhibiting the striking expansion of the distal end of the fifth joint figured by von Willemoes Suhm, and of which he says,[1]—"the enlarged distal terminations of the limbs and of the antennæ are not, like the remaining part of the appendages, transparent, but are of a milk-white colour, produced, I believe, by glands in their interior analogous to the glands in the enlarged claw of *Phronima*." It is possible, I think, that, while the specimen was fresh, the opacity of the termination of the fifth joint, contrasted with the transparency of the rest, produced an optical impression of expansion beyond the reality, but it is even more probable that, during the years the specimen has been in spirit, some of the actual expansion has been lost by a discharge of the contents of the gland-cells.

Fifth Peræopods similar to those of the male specimen except in regard to the fifth joint, which, except at the narrow neck and the narrow place of insertion for the finger, is strongly swollen and closely packed with gland-cells; it widens gradually for about two-thirds of the length, and then narrows very slightly to the distal end, which forms a smooth-edged palm, against which the small bent finger is capable of impinging, though it cannot reach its extremity; the hinder margin is smoothly convex, the front is straight and almost entirely smooth, though here and there bearing very slight traces of a lost dentation; the lateral setæ are as in the male.

Uropods.—The first pair scarcely over six-tenths of an inch long from the base to the extremity of the coalesced inner branch, seven-tenths of an inch to the extremity

[1] *Loc. cit.*, p. 630.

of the outer branch; the outer branch eight-thirtieths of an inch long, or more than half the length of the peduncle excluding the inner branch; the ornamentation is similar to that in the male specimen, except that of the two pectinate margins of the outer branch, both are slightly toothed; this branch is distally a little, but conspicuously dilated, and then rather abruptly narrowed to an acute apex; the second pair similar to the first, the branches equally long, the peduncles shorter.

The Ventral Surface of the animal is remarkable. The description given by von Willemoes Suhm of the genital organs has been already quoted in the Note on that writer (p. 438). The figure here given of the anterior part of the ventral surface of the peræon shows at the top the central spine to which von Willemoes Suhm refers; to the rear of this, what he calls "the genital papilla" is formed by two pairs of plates, the plates of each pair meeting and fitting closely together along the median line of the animal; the opening of these valves seems to be dependent upon the movement of the small second pair of gnathopods, which are very stiffly connected with them; each plate has on the inner side and inner surface a lobe, of which the distal and inner margins are beset with setæ, and which may be supposed to correspond with the marsupial plates of normal Amphipods. Behind the "genital papilla," there is a transverse wrinkling of the ventral surface, and a little to the rear of this, a pair of rudimentary branchiæ, one of which is shown in its relative position on the Plate; behind this there is another transverse wrinkle, and again a little to the rear another pair of rather larger rudimentary branchiæ, one of which is also shown in its relative position; these rudimentary branchiæ may be supposed to correspond to the small pairs of double branchiæ found attached to the second gnathopods and first peræopods in the male specimen. Only the first two joints of the second gnathopod are shown in the figure of the valves, the distal part of that limb being represented in a separate figure at the lower left-hand corner of the Plate.

Length, three inches and three-tenths, or to take the measurement made when the specimen was fresh, "84 mm."

Locality.—Station V., off the Strait of Gibraltar, January 28, 1873; lat. 35° 47′ N., long. 8° 23′ W.; depth, 1090 fathoms; bottom, Globigerina ooze; bottom temperature, 38°·5; surface temperature, 61°. One specimen, female. Trawled.

Remarks.—For the original description of *Oniscus spinosus* from the Atlantic, see Note on J. C. Fabricius, 1775. Fabricius makes a reference in that description to the *Museum Banksianum*. In the cases of this museum, preserved at South Kensington, no such specimen is now to be found, but among the Zoological drawings by Sydney Parkinson in Capt. Cook's First Voyage 1768–1771, which form part of the Banksian Museum, there are three figures undoubtedly representing a species of *Cystisoma*. These figures are signed, "Sydney Parkinson pinxt. 1768," and bear the manuscript

name "*Onidium spinosum*." It may be taken for granted that they represent the species *Oniscus spinosus* of Fabricius; they give a dorsal, a ventral, and a lateral view of the animal, and vary in length from four inches and three-quarters to nearly five inches and a half. Since, with the other Amphipoda which he represents, Parkinson gives life-size figures as well as the enlarged ones, it may be presumed from the absence of any small figure of "*Onidium spinosum*," that five inches was approximately the length of the actual specimen, or not so greatly in excess of it as to be thought to demand a more exact specification of the real size. In general appearance and details, and in particular in the antennæ and uropods, the figures agree with the male specimen brought home by the Challenger, but in the fifth peræopods there is the remarkable thickening of the fifth joint, which has been described for the female only and to which Fabricius no doubt alludes when describing this joint as "articulo ultimo clavato."

The male and female specimens which I have here placed together under the name *Cystisoma spinosum* (Fabr.), are regarded by Bovallius as representing two distinct species, the male being named by him *Thaumatops neptunus* (Guérin-Méneville), and the female *Thaumatops pellucida* (von Willemoes Suhm). In the female, the upper antennæ are longer than in the male, and have the termination of the long second joint swollen, containing a gland; the fifth joint of the fifth peræopods is swollen, smooth-edged, and full of gland-cells; the outer ramus in each pair of uropods is longer than the inner, and swollen near the apex, containing a gland. These make a striking group of differences, outside of those which are obviously sexual, but it will be noticed that there is probably a correlation between the differences, since all are connected with glandular contents of the organs concerned, in the lengthened antennæ at one end of the animal, and the lengthened rami of the uropods at the other, while in the peræopods, midway between these two extremities, it is easy to understand that the dentate edge, useful to a laminar joint, would be of no service to the joint when by the packing with gland-cells it becomes more or less cylindrical. In Parkinson's figure of "*Onidium spinosum*" we find the antennæ and uropods agreeing with the Challenger male specimen, but the fifth peræopods agreeing with the Challenger female specimen. From the perplexity which thus arises, it would be easy to escape by saying that Parkinson's is a third intermediate species between the other two, and future discoveries may prove this to be the true solution, but for the present I am disinclined to ground specific distinction on characters which may turn out to be merely sexual. Moreover, the differences, though striking when discussed on paper, are comparatively trivial when contrasted with the still more striking resemblance, both in general and in detail, which the two fine specimens present.

Cystisoma spinosum (Fabricius). Specimens C, CC.

Specimen C.—*Length*, one inch and eight-tenths; antennæ seven-tenths of an inch, a little longer than those of the very much larger specimen A, and placed much nearer to one another than in that specimen; third peræopods just under an inch and a half, the first joint half an inch, the following two together nine-thirtieths, the fourth and fifth each ten-thirtieths of an inch; the fourth peræopods just under an inch in length, the fourth and fifth joints equal; no trace could be perceived of the small branchial vesicles related to the second gnathopods and first peræopods; the uropods similar in their proportions to those of the specimen from Station 224.

Specimen CC.—*Length*, one inch and eight-tenths; the antennæ not especially near together as in the companion specimen; the small branchial vesicles related respectively to the second gnathopods and the first peræopods, and the three large pairs, similar to those described for specimen A.

Locality.—Station 101, August 19, 1873; off Sierra Leone; lat. 5° 48′ N., long. 14° 20′ W.; depth, 2500 fathoms; bottom, blue mud; bottom temperature, 36°·4; surface temperature, 79°·2. Two specimens. Trawled.

Remarks.—Sir Wyville Thomson (see Note, p. 471), in noticing specimen B, says, "We have since taken several specimens at different stations in the Atlantic," and "as a small male was in one case captured in the towing-net," he infers that the animals of this genus occasionally come to the surface. As no especial notice is taken of the occurrence of *Cystisoma* at the remarkable depth of 2500 fathoms, some doubt may have been felt whether the two specimens of Station 101 actually came from that depth. Indeed, as Mr. Murray has frequently pointed out, although the dredge or trawl may have been down to a depth of 2500 fathoms, there is no certainty that many of the animals captured came from that depth, as they may have been taken at any depth between the bottom and surface. Since only four specimens of the genus *Cystisoma* seem to have been taken in the Atlantic, I am inclined to believe that the "several specimens" mentioned may have included some belonging in reality to the genus *Lanceola*.

Cystisoma spinosum (Fabricius) (Pl. CLVI.). Specimen D.

Head with twelve teeth on each lateral margin.

Upper Antennæ.—The distal part broken off, so that the full length could not be ascertained, the remaining portion rather thick, tapering, one-fifth of an inch long. Of the spines on either side of the central line on the under side of the head, there are only two pairs, the upper pair (which possibly represent the *Lower Antennæ*) being

much longer than the other pair; the second pair is not spine-like, but tubercular, blunt-ended, apparently forming the antennary gland-cone with its terminal channel.

Mouth Organs.—It is extremely difficult to say whether the small differences observed between the mouth organs of the present and those of larger specimens are of any specific value; here on the left mandible the cutting edge has nine teeth, and the secondary plate has ten, the cutting edge of the right mandible has nine teeth; the rows of denticles on the crown of the molar tubercle were here seen to number about twenty, forming a serried mass; the outer plate of the first maxillæ has on its inner margin four setæ, followed by three rather narrow spines; these are followed without interruption on the apical margin by a connected series of spines successively stouter, seven in number, to which succeeds the set of six or seven stout spines grouped round the outer apex; there are also several submarginal setæ; the outer plates of the maxillipeds have five teeth on the inner margin, the one nearest the apex being irregularly jagged.

First Gnathopods less than one-fifth of an inch long; *Second Gnathopods* a quarter of an inch; *First Peræopods* eleven-twentieths; *Second Peræopods* sixteen-twentieths; *Third Peræopods* a little over an inch; *Fourth Peræopods* eighteen-twentieths of an inch; *Fifth Peræopods* nine-twentieths; the relative lengths of the fourth and fifth joints of the various peræopods are like those described for Specimen F from Station 196; the *First Uropods* are six-twentieths of an inch long to the extremity of the narrow outer branch, the length of the branch being two-twentieths; the coalesced inner ramus is slightly shorter; the *Second Uropods* are five-twentieths of an inch long, the outer ramus almost two-twentieths.

Pleopods.—Peduncles as long as the rami; coupling spines very slender, joints of the rami numbering from ten to twelve, the first joint in each ramus very long.

Telson as usual very small and shallow, not so broad as the peduncles of the uropods, not so long as broad, its distal margin rounded.

Length.—The figure at the top of the Plate is intended to represent the natural size, and according to this it would not be more than an inch and a quarter long, but the specimen was in a crumpled flaccid condition, and might possibly have been in life rather longer.

Locality.—Station 170A, July 14, 1874; off the Kermadec Islands; lat. 29° 45′ S., long. 178° 11′ W.; depth, 630 fathoms; bottom, volcanic mud; bottom temperature, 39°·5; surface temperature, 65°·2. One specimen, male or young. Trawled.

Cystisoma spinosum (Fabricius). Specimen E.

This specimen of moderate size was taken comparatively near to specimen G, the distance between their respective localities being about 3 degrees of latitude and 17

of longitude; from the locality of the large specimen A its place of capture was far more remote, the distance being about 6 degrees of latitude and 170 of longitude, yet between these two specimens, obtained at opposite sides of the globe, I could perceive no salient marks of difference, other than the following measurements :—

Length from the front of the head (as with the other specimens not including the antennæ) to the extremity of the uropods, two inches; antennæ just over six-tenths of an inch; first peræopods a little over six-tenths of an inch, second peræopods a little over an inch, third peræopods an inch and a half, fourth peræopods (fifth joint broken) about an inch and one-tenth, fifth peræopods seven-tenths of an inch; in the large third peræopods the first joint is half an inch long, the two following together three-tenths of an inch, the fourth eleven-thirtieths, and the slender fifth ten-thirtieths of an inch; the minute fingers have not been taken into account in the measurements either of this or the other specimens; the first uropods are almost four-tenths of an inch long to the extremity of the coalesced inner branch, the outer branch, which at least in its present condition is a little shorter than the inner, is just under one-tenth of an inch long; the second uropods, which reach just beyond the first, are three-tenths of an inch long, the outer branch as long as the inner, just over one-tenth of an inch long.

Locality.—Station 224, March 21, 1875; between the Admiralty Islands and Japan; lat. 7° 45′ N., long. 144° 20′ E.; depth, 1850 fathoms; bottom, Globigerina ooze; bottom temperature, 35°·4; surface temperature, 81°·2. One specimen, male. Dredged.

Remark.—Whether the small branchial vesicles of the second gnathopods and first peræopods were present in this specimen, I could not determine without dissecting it.

Cystisoma. Specimen F.

Antennæ one inch and one tenth in length, the basal joint not longer than broad, its distal margins slightly convex, the terminal joint minute, acute, the second joint more than an inch long, with the usual slight serration, some slender setæ, which are most numerous near the base, the joint tapering for some distance from its base, but for much of its length narrow and of nearly uniform breadth; just before the narrow apex is reached it shows a slight tendency to thicken.

Mouth Organs, so far as could be seen without separating them from one another, in close agreement with those already described for the species *Cystisoma spinosum.*

First Gnathopods four-twentieths of an inch long; *Second Gnathopods* more than six-twentieths; *First Peræopods* fifteen-twentieths; *Second Peræopods* one inch and two-twentieths; *Third Peræopods* one inch and twelve-twentieths; *Fourth Peræopods* one inch and seven-twentieths; *Fifth Peræopods* a little over fourteen-twentieths of

an inch; in the first pair the fourth joint is a little longer than the fifth, in the second and third they are as nearly as possible equal, in the fourth pair the fifth joint is perhaps slightly the longer; in the fifth pair the fifth joint is longer than the third, and the third than the fourth; branchial vesicles were observed only with the second, third, and fourth pairs, those of the second being decidedly the smallest, those of the fourth apparently the largest.

Uropods.—First pair a little under eight-twentieths of an inch long to the extremity of the coalesced inner branch, a little over eight-twentieths to the end of the outer branch, this branch being about half the length of the peduncle; the second pair about seven-twentieths of an inch to the end of the outer branch, which as in the first pair is a little longer than the inner.

Length.—The specimen was not in good order and the measurement was not taken before it was broken up; the full length was probably not much over two inches.

Locality.—Station 196, October 13, 1874; north of Amboina; lat. 0° 48′ 30″ S., long. 126° 58′ 30″ E.; depth, 825 fathoms; bottom, hard ground; bottom temperature, 36°·9; surface temperature, 83°. One specimen, male. Trawled.

Remarks.—If, in view of the great length of the upper antennæ, it be necessary to separate this specimen from the others, I should propose to name it *Cystisoma parkinsoni*, in honour of the artist, who, so far as is known, was the first to delineate any species of this genus. It will be observed that in the antennæ in question the basal joint is shorter than in other specimens where the total length of the antennæ is far less.

Cystisoma. Specimen G.

Head measuring seventeen-twentieths of an inch on the ventral surface from the front to the mouth organs; thirteen teeth on the lateral margin, two pairs of spines on the ventral surface.

Upper Antennæ eight-tenths of an inch long, the tip broken, but probably a very small piece missing.

Third Peræopods two inches and a half in length, the fifth joint decidedly longer than the fourth.

Fifth Peræopods just over an inch in length, the fifth joint cylindrical, packed with gland cells, the front margin denticulate and apically produced into a tooth or process, between which and the narrowed part of the joint where the finger hinges there is a concave palm; the much curved finger touches with its tip the middle of the palm. The two joints here described much resemble the corresponding joints

figured by Bovallius for his *Thaumatops lovéni*, but there the fifth joint is "twice longer than the carpus," while here it is not once and a half as long.

The small branchial vesicles of the second gnathopods and first peræopods are, I think, present in this specimen.

Uropods.—The outer branch is scarcely longer in either pair than the inner, and is not apically dilated.

Length.—Three inches.

Locality.—Station 214, February 10, 1875; off the Meangis Islands, north of Papua; lat. 4° 33′ N., long. 127° 6′ E.; depth, 500 fathoms; bottom, blue mud; bottom temperature, 41°·8; surface temperature, 80°·5. One specimen. Trawled.

Remarks.—Should it be thought necessary to make this a separate species, I would propose for it the name *Cystisoma fabricii*.

It is conceivable that by a diligent counting and comparing of the teeth on various parts of the animal of *Cystisoma spinosum*, and comparative measurements of the limbs, one might make a species of every specimen; on the other hand, among specimens from so many parts of the world some specific variation might be expected, difficult as it is to seize any characters which can be regarded as at once so salient and so constant as certainly to warrant the establishment of any fresh species.

The following table shows the distribution of the Challenger specimens:—

1. Station V, lat. 35° 47′ N., long. 8° 23′ W.; depth, 1090 fathoms.
2. Station 101, lat. 5° 48′ N., long. 14° 20′ W.; depth, 2500 fathoms (surface?).
3. Station 107, lat. 1° 22′ N., long. 26° 36′ W.; depth, 1500 fathoms.
4. Station 170A, lat. 29° 45′ S., long. 178° 11′ W.; depth, 630 fathoms.
5. Station 196, lat. 0° 48′ 30″ S., long. 126° 58′ 30″ E.; depth, 825 fathoms.
6. Station 214, lat. 4° 33′ N., long. 127° 6′ E.; depth, 500 fathoms.
7. Station 224, lat. 7° 45′ N., long. 144° 20′ E.; depth, 1850 fathoms.

Besides the specimen which Fabricius records from the Atlantic, and that which Guérin-Méneville records from the Indian Ocean, there is a specimen figured by Sir J. D. Hooker, as having been obtained on the Antarctic Expedition at "33° 23′ S., 7° 40′ E." Bovallius records a specimen 105 mm. long, which he names "*Thaumatops Lovéni*," from the Indian Ocean, a specimen 57 mm. long, which he names "*Thaumatops longipes*," from "off the west coast of Australia," and a second specimen of "*Thaumatops longipes*," 50 to 60 mm. long, "taken just at the southern limit of the Arctic region at lat. 59° 38′ N., long. 5° 24′ W." The genus therefore appears to have a range north and south of more than ninety degrees, and round the world from east to west, as well as a capacity for sounding very considerable depths of the ocean.

Family Paraphronimidæ, Bovallius, 1887.

This family is placed by Bovallius between the Cyllopodidæ and Thaumatopsidæ [Cystisomidæ]. He gives for it the following diagnosis :—

"Head very large, tumid. Eyes very large. First pair of antennæ fixed at the anterior side of the head, with the first joint of flagellum tumid, ovate, the rest of flagellum terminal, few-jointed. Second pair fixed at the inferior side of the head, angulated. Mandibles without palp. Seventh pair of pereiopoda [*Fifth Peræopods*] not transformed."

To this may be added the special characteristic that the *Maxillipeds* end in a single broad plate, no doubt representing the usual pair of outer plates in coalescence with the inner plate or tongue.

Genus *Paraphronima*, Claus, 1878.

1878.	*Paraphronima*,	Claus, Zool. Anzeiger, Jahrg. i. No. 12, p. 269.
1879.	„	Claus, Der Organismus der Phronimiden, p. 6.
1885.	„	Bovallius, On some forgotten genera Amph. Crust., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 10, No. 14, p. 9.
1885.	„	Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 424.
1886.	„	Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 489.
1887.	„	Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 13.

For the original definition of the genus, see Note on Claus, 1879 (p. 488). Claus while placing the genus among the Phronimidæ suggests that, with reference to the tube-shaped liver appendages of the intestine, it might be correct to place it among the Hyperidæ. The following definition agrees nearly with that given by Claus.

Eyes.—Each with two closely approximate groups of ocelli, a large and a small.

Upper Antennæ attached at the front of the head, in both sexes having a short three-jointed peduncle and a flagellum with large apically pointed first joint.

Lower Antennæ attached just in front of the mouth organs, with four free joints in the male, the second and third short, these with the long terminal joint in the adult bent downwards; in the female with one conical or stiliform joint and a minute second joint at its apex.

Mandibles without palp in both sexes.

Maxillipeds ending in a single broad concave plate.

The *First Gnathopods* with third joint and wrist distally widened, so as to be in an imperfect fashion complexly subchelate; the *Second Gnathopods* with joints unexpanded, the hand produced distally into two little plates, one on either side the finger.

The *Peræopods* simple, the fifth the shortest, the first four pairs having branchial vesicles; in the female the first three pairs of peræopods and the second gnathopods having marsupial plates.

The three pairs of *Uropods* having the peduncles longer than the lanceolate rami; the outer branch shorter than the inner in the first and second pairs.

Telson very short.

Head large, tumid, squared in profile, deeper than the peræon, the mouth organs projecting backwards from the lower hinder corner; body dorsally compressed.

Peræon narrowing towards the seventh segment, sometimes becoming tumid at the third segment.

The eyes to some extent agree with those of *Phronima*, in that the grouping of the ocelli justifies the expression of divided-eye for each of the pair. In the upper division the ocelli are arranged almost in parallel rows, in the lower and smaller in a radiating manner; in both, as Claus observes, they stand wide apart.

Bovallius is inclined, though not without doubts, to unite the genus *Daira*, Milne-Edwards, 1830, with *Paraphronima*, Claus, while decidedly and with good reason separating both from *Dairinia* [*Dairilia*], Dana. In 1885, to explain his views on these points, he gave parallel descriptions of the three genera mentioned, but in the adaptation of them to a uniform terminology, some obscurity has arisen. The original definition of *Daira* has been already quoted in the Note on Milne-Edwards, 1830 (p. 143). In 1830 Milne-Edwards says that his *Daira gabertii* is probably not adult, that it has but one pair of antennæ, much like the lower antennæ in *Hyperia*, that the first segment of the peræon is extremely short (étroit[1]) and almost entirely concealed under the second, that the second gnathopods end in a sort of didactyle hand, the movable finger of which extends a little beyond the immovable finger, and is apically armed by a crooked and movable nail, and that the first gnathopods, though similar to the second, have the immovable finger less developed. I cannot therefore see any probability that *Daira* is the same as *Paraphronima*, since in the latter there are two pairs of antennæ in both sexes, the first segment of the peræon is not at all concealed under the second, the second gnathopods are less stout than the first, while neither pair has any immovable finger at all, the second pair not even having any spines which might by chance be mistaken for one. Bovallius, it is true, among the characters in the definition of *Paraphronima*, Claus, gives the following:—"The last joints of the second pair [of gnathopods] forming a didactyle hand, the moveable finger consists only of the last joint, and is longer than the fixed one." Claus' own description, however, contains nothing of this sort, and the "fixed" finger probably refers to the

[1] That *étroit* refers to the measurement of the segment from front to back, not from side to side, seems clear from the description of the peræon, "le thorax point enflé au milieu comme dans l'Hypérie de Latreille, mais diminuant progressivement de volume d'avant en arrière."

little appendages at the apex of the hand which Claus figures. But that Milne-Edwards in describing *Daira* was not thinking of a didactyle hand like this very clearly appears from his remarks on *Themisto*, in which he says, "the second gnathopods are sometimes imperfectly prehensile, the antepenultimate joint being compressed and prolonged anteriorly so as to form a sort of hand and an immovable finger, on the upper edge of which impinges the movable claw, which is conical and formed of the last two joints, an arrangement exactly like that which we have just seen in the genus *Daira*."

Paraphronima cuivis, n. sp. (Pl. CLVII.).

The Head of about equal length and depth, much deeper than the peræon, nearly equal in length to the first four of the peræon-segments together; the seventh segment of the peræon the longest, yet not so long as either of the first three segments of the pleon, which are also much deeper, with the postero-lateral angles rounded; back of the animal, except the head, obtusely ridged, peræon scarcely, pleon rather more strongly.

The Eyes occupy most of the surface of the head, and may be regarded as two pairs very closely united, the larger pair occupying not only the summit but most part of the sides of the head; the much smaller second pair are near the lower margin, the little ocelli of this pair radiating from a point in advance of the mouth organs.

Upper Antennæ straight, projecting from the triangular groove in the front of the head; the peduncle short, the first joint considerably longer than the other two together, widening distally; the flagellum stout, lanceolate in outline, far longer than the peduncle, the two together as long as the head; the inside of the flagellum carrying a brush of broad filaments and fringed with short setules which project along the lower margin and at the apex; the second joint is minute.

Lower Antennæ inserted close to the mouth-organs, the first and second joints coalesced with the head, but with the opening of the gland-cone distinct; the third joint nearly as long as the head, slender, directed forwards, slightly curved so that the concave upper margin, which is closely fringed with setules, fits into the gently convex channelled lower margin of the head; the next joint is short, though longer than broad, with some setules on the upper margin; this joint bends downwards, the following, scarcely longer and similarly armed, is in line with it, and so is the long straight terminal joint, which perhaps alone represents the flagellum; this is more than half the length of the third (first free) joint, with convex lower or hinder margin, the front or upper pretty closely fringed with filaments, of which the truncate yet almost acute apex also carries a group. It is a question whether the long third joint represents the third, fourth, and fifth joints of the peduncle in coalescence, leaving the three remaining joints for the flagellum, or whether the two short joints are respectively the fourth and fifth of the peduncle.

The Mouth-Organs are placed at the lower hinder corner of the head, projecting backwards below the peræon, and giving a very sinuous appearance to the hind margin of the head.

Epistome arched, broader than deep.

Upper Lip unsymmetrically bilobed by a small cleft of the distal margin, one side of the cleft being minutely furred.

Mandibles.—The cutting edge shows six or seven little teeth; the secondary plate on the left mandible is narrow at the neck, then widening, but not nearly as broad distally as the principal plate, the teeth eight or nine in number; on the right mandible there appears to be a secondary plate with the edge pectinate rather than denticulate; some small spines to the rear of the cutting plate run from the lower margin of the trunk along a small ridge of the inner surface; no molar tubercle or trace of palp could be discovered; the trunk of the mandible is comparatively large.

Lower Lip very small, so far as could be made out.

First Maxillæ.—Inner plate (if rightly observed) smooth-edged, oval; the outer plate appears to have seven or eight spines on the distal margin, the outermost the stoutest; there are also some cilia or setæ on the plate; the palp is broad for some distance from the base, and has three very small spine-teeth and a short slender spine on the somewhat oblique distal margin, and sometimes, if not always, a setule on the outer margin.

Second Maxillæ.—A single plate was doubtfully observed, with cilia on the rounded distal margin and on the inner margin.

Maxillipeds.—The first joint (or chin) short and narrow, the second joint also short, expanding distally, the third joint much wider than the second, transversely oval, like a rather deep dish, of which the width appears to be nearly twice the depth; the distal margin is sinuous, with a little central cleft, on either side of which the margin has three little setules at a distance from one another; there are also two small prominences, one on each side of the central cleft, probably representing the distal margin of the inner plate, which, as already suggested, would seem to be, not as usual distinct, but in coalescence with the two outer plates.

First Gnathopods.—The side-plates are not marked off from the segment, except in so far as there is a narrow projection to which the limb is attached. In this respect all the limbs of the peræon are alike, as also in the possession of gland-cells, to leave room for which the muscles of the first joint are in no case extensive. The first joint wider than any of the other joints and considerably longer than them all together, the margins smooth; the second joint not longer than broad; the third a little longer than the second; with scarcely any free front margin, the hind margin smooth, the truncate distal margin projecting behind the wrist, set round with six strong spines; the wrist as long as the hand and finger together, and more than twice the breadth of the hand, widening a little distally, the convex front longer than the nearly straight hind margin, the hind

margin microscopically pectinate, having a spine at the apex, the distal margin finely pectinate, projecting behind the hand; the hand narrow, finger-like, a little curved and tapering, the distal end rounded, but with a little setule-carrying indent, microscopically pectinate, produced over the base of the small finger in the same way that the trunk of the finger is produced over the base of its own acute nail; the nail is nearly as long as the trunk of the finger.

Second Gnathopods a little longer, but narrower than the first. The first joint narrower, not much longer, than in the preceding pair, as long as the four following joints together; the second joint a little longer than broad; the third a little longer than the second, with parallel margins, unarmed; the wrist not half the length, about half the breadth of the first joint, longer and broader than the hand, nearly straight and smooth; the hand narrow, tapering, longer than the hand of the first gnathopods, produced in two delicate transparent plates beyond the base of the finger's nail, the plates finely serrate on the inner edge, but the serration is not easy to observe; the finger small and slender, the extremely acute nail shorter than the trunk of the finger, with a minute setule at the base on the inner margin. The fingers of the second gnathopods face the mouth-organs, while those of the first have the ordinary position.

First Peræopods.—Branchial vesicles small, oval, not half the length of the first joint. The limb much longer and broader than the second gnathopods, the first joint about as long as the third and fourth together, smooth-edged, the second rather longer than broad, the third about once and a half as long as the second, the fourth nearly three times as long as the third, having some setules along the almost straight hind margin; the fifth joint more slender, slightly curved and tapering, together with the finger equal in length to the fourth joint; the finger small, acute, a little curved.

Second Peræopods.—Branchial vesicles larger than in the preceding pair, the limbs similar.

Third Peræopods.—Branchial vesicles larger than in the preceding pair. The joints of the limb, with the exception of the finger, rather stouter and a little longer than in the second peræopods.

Fourth Peræopods.—Branchial vesicles subequal to the preceding pair, the limb a very little shorter.

Fifth Peræopods.—The limb considerably shorter than the preceding pairs, the difference affecting all the joints except the first, but especially the fourth and fifth, which together are not equal in length to the first, instead of being, as in all the other peræopods, much longer than it; the fifth joint shorter and much narrower than the fourth, curved, tapering; the finger small, nearly straight, acute.

Pleopods.—The peduncles massive, in the first two pairs longer than the rami; the two coupling spines have the base bulbous, the shaft feathered with from three to five retroverted teeth on each margin, and the apex crescent-shaped; in the cleft spine of the

inner ramus it is the shorter arm that is shaped like the hand of a clock; the joints of the rami vary from five on the inner to seven on the outer ramus; the pair of feathered setæ on each joint are stout.

Uropods.—Peduncles of the first pair scarcely as long as those of the second and much narrower, longer than the rami; the outer ramus much shorter and narrower than the inner, almost completely smooth-edged, acute like the rest of the rami; inner ramus nearly smooth on the inner margin, the outer margin pectinate with thirty or forty very long slender spine-like teeth, and near the apex cut into some strong downward pointing teeth; peduncles of the second pair longer than the rami; the outer ramus shorter than the inner, longer than the outer of the first pair, its outer margin nearly smooth, its inner serrate, less and less closely as it approaches the apex; the inner ramus broadly lanceolate, with both margins denticulate, the outer more closely than the inner; the peduncles of the third pair as long and broad as those of the second, the rami equal in length, not as in the other pairs more, but less, than half the length of the peduncles; the outer ramus with the outer margin almost smooth, the inner denticulate; the inner ramus having eight teeth or serratures on its nearly straight inner margin, and nine or ten stronger teeth on the outer, the proximal part of which is straight and smooth; the peduncles of the second and third pairs have the under surface grooved for a short distance from the base backwards.

Telson very small, distally rounded, apparently rather tumid and very thin-walled.

Female.

Upper Antennæ.—First joint cylindrical, rather longer than broad, second about a fourth the length of the first, narrowing towards the still shorter third joint; the flagellum not quite so broad as the peduncle, but twice as long, with convex margins tapering to an outdrawn point, the inner margin fringed with groups of filaments.

Lower Antennæ shorter than the terminal joint of the upper; the gland-cone is observable on the inner side of the antennæ, but coalesced with the wall of the head; the third (first free) joint is tapering, followed by a minute terminal joint.

Marsupial Plates much larger than the branchial vesicles, without setæ; a large pair attached to each of the first three pairs of peræopods and a small pair to the second gnathopods.

Pleopods.—The peduncles rather more slender than in the male.

Length of the male specimen, in the position figured, from the front of the head to the extremity of the uropods, three-tenths of an inch; fully extended, the length would be about four-tenths.

Locality.—July 1875; between Japan and Honolulu, lat. 35° N.; surface. Seven specimens, male and female.

To this species also belong specimens from the following localities:—

"Phronimid, N. W. Pacific, ♂, ♀." Two specimens mounted in Canada balsam during the voyage.

"Phronimid, ♂, N. W. Pacific;" a specimen in Canada balsam.

"Api to Cape York;" a specimen in Canada balsam.

Station 181, August 25, 1874; Api to Cape York; lat. 13° 50′ S., long. 151° 49′ E.; surface; surface temperature, 80°. This specimen is a young male, with the lower antennæ four-jointed, not so long as the head, the terminal joint the longest, but this and the two preceding short joints still in line with the first joint; the large terminal joint of the upper antennæ has filamentary cylinders only along the distal half.

Station 241, June 23, 1875; east of Japan; lat. 35° 41′ N., long. 157° 42′ E.; surface; surface temperature, 69°·2. Two specimens, female. The four pairs of marsupial plates are partially developed in the larger of these two specimens. It may be noticed that most of the specimens, whether mounted in Canada balsam or preserved in spirit, are yellow, but these two were lighter than the rest.

Station 243, June 26, 1875; North Pacific, east of Japan; lat. 35° 24′ N., long. 166° 35′ E.; surface; surface temperature, 71°. One specimen.

Station 245, June 30, 1875; between Japan and Honolulu; lat. 36° 23′ N., long. 174° 31′ E.; surface temperature, 69°. One specimen, male, with the head much deeper than the peræon, the fourth pair of branchial vesicles unequally developed, the vesicle on one side normal, that on the other very much smaller.

July 4, 1875; North Pacific, between Japan and Honolulu; lat. 36° 42′ N., long. 179° 50′ W.; surface, night; surface temperature, 71°·5. Three specimens. One of the specimens is an adult male; another a young male, as may be judged by the lower antennæ, which are straight, the terminal joint reaching a little beyond the head, a little shorter than the first free joint, which is very slightly curved; the third is probably a young female.

September 1, 1875; North Tropical Pacific; lat. 7° 17′ N., long. 147° 20′ W.; surface temperature, 81°·7. One specimen, male.

Station 352, April 13, 1876; Atlantic, off the west coast of Africa; lat. 10° 55′ N., long. 17° 46′ W.; surface; surface temperature, 77°·7. One specimen, male. This Atlantic specimen shows only the most trifling differences from the Pacific specimens. In the first gnathopods the wrist is a little less broad and has two spines instead of one at the outer apex; in the second gnathopods the wing-like plates, *dactyloptera* of Spence Bate, at the apex of the hand have the margin more conspicuously pectinate; the inner ramus of the first uropods has its inner margin more decidedly serrate near the apex.

May 7, 1876; Atlantic, south-west of the Azores; lat. 34° 22′ N., long. 34° 23′ W.; surface; surface temperature, 67°·8. One specimen, male, mounted in Canada balsam

during the voyage. This specimen was taken towards the close of the voyage, and appears to agree closely with that last mentioned.

Remarks.—The specific name—meaning *whose you please*—refers to the difficulty of deciding whether the various specimens belong to a distinct species or to one of the five or six specific names with which Claus and Bovallius have endowed the genus *Paraphronima*. None of the species bearing those names have been at all fully described, and there seems some probability that a single name may suffice for them all.

Family Phronimidæ, Dana, 1852.

For Dana's account of the family, see Notes on Dana, 1852 (pp. 259, 261). For the definition by Claus, see Note on Claus, 1879 (p. 487). Bovallius in 1887 gives the following diagnosis :—

"Head large, tumid, more or less conical, much deeper than the body. Eyes large, occupying parts of the sides and the top of the head. First pair of antennæ fixed at the anterior side of the head; with a multiarticulate flagellum (in the male); second pair fixed at the anterior side of the head, multiarticulate (in the male) or rudimentary (in the female). Mandibles without palp. Seventh pair of pereiopoda not transformed [*Fifth Peræopods* normal]. Peduncles normal."

From this family Bovallius excludes the Phrosininæ and also two of the genera of Claus' Phroniminæ, namely *Paraphronima* and *Phronimopsis*. He adds a new genus, *Dairella*. In the expression "peduncles normal" there is evidently some omission or other error of the press. If, as is probable, the expression intended was—*uropods* normal—the liability of the second pair to become rudimentary should not be left unnoticed.

Genus *Dairella*, Bovallius, 1887.

1887. *Dairella*, Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 24.

For the definition of this genus, together with that of the subfamily Dairellinæ, in which Bovallius places it, see Note on that author, 1887 (p. 589). It will be remembered that the expression—"first and second pairs of pereiopoda simple"—refers to the first and second pairs of gnathopods, and that the expression—"all the pereiopoda are simple walking legs"—includes the two pairs of gnathopods, as well as the five pairs of peræopods. That the differences between this branch of the Phronimidæ and the family Paraphronimidæ are not at the first glance very striking may be inferred from the circumstance that *Dairella californica* was originally named *Paraphronima californica*, before it was made the type of the new genus, but, besides the distinct character of the antennæ, to

which attention is drawn in the diagnoses of the two families, there are also some notable differences in the mouth-organs. The generic character—"peduncles of uropoda very broad"—requires some modification, since the peduncles of the second pair are described as narrow in *Dairella californica*, Bovallius, and are narrow also in the species now to be described.

Dairella bovallii, n. sp. (Pl. CLVIII.).

Head wider than deep, deeper than long, not so long as the coalesced first and second segments, together with the third segment of the peræon; each of the first three segments of the pleon longer than any of those of the peræon, and having the postero-lateral angles rounded; the dorsal line of the specimen a little corrugated.

Eyes occupying almost the whole surface of the head as seen from above or in profile; of the four groups of ocelli the lower pair are as large as the upper, which they almost join at the sides of the head; only the lower groups fold round to the front of the head, where they are separated by a wide space.

Upper Antennæ standing wide apart on the upper part of the front of the head. In the male, peduncle short, tumid, the first joint not longer than broad, the two following very short, much broader than long; the first joint of the flagellum broad, narrowing a little apically, much longer than the peduncle, the tumid breast covered with a large brush of elongate filaments; the remainder of the flagellum comparatively narrow, with small and slender filaments at intervals; the second joint little longer than broad, the third twice as long as the second, the fourth as long as the second and third together, but thinner, the fifth a little shorter than the fourth; the remainder broken. In the female these antennæ are slender, the first joint of the peduncle little dilated, the flagellum consisting of a single long joint, slightly curved, of almost uniform breadth, except at the apex which is not very acute.

Lower Antennæ attached much below the upper; the coalesced first and second joints short, broader than long, the third joint smaller than these, the fourth smaller than the third, the fifth longer than the preceding two together and forming an angle with them, wider distally than at the base; the first joint of the flagellum longer and abruptly much narrower than the last of the peduncle, narrowing from the base to the middle, again a little widened at the apex. Remainder of these antennæ missing. In the female the rudiments of these antennæ, if present, were not observed.

Upper Lip unsymmetrically bilobed by a narrow cleft in the distal margin, one lobe being a little less deep than the other.

Mandibles.—Cutting plate small, triangular, with straight, finely denticulate edge; there appears to be a similar secondary plate on the left mandible, but it was not clearly made out; the molar tubercle with broad multidenticulate crown, as usual straight-edged

in profile, the prominent teeth in this view twelve in number, pretty widely spaced; the surface of the mandible for some distance behind the tubercle scabrous with minute teeth or prickles. There is no trace of a palp.

First Maxillæ.—The pair appear to be connected by a thin membrane; no inner plate was perceived; the outer plate distally cut into three very sharp teeth; the inner margin of the palp straight, serrate, carrying at its apex a small sharp spine-tooth, the outer margin convex, smooth, the distal convex, with slight outward directed serrature; both plate and palp being so bent that the distal margins of one maxilla may antagonize with those of the other.

Second Maxillæ.—These are obscure, probably small and unarmed.

Maxillipeds.—The base is formed by an oblong plate having a flat distal margin with its corners rounded and a small spinule projecting near each of them; a little above the middle of this, and not nearly reaching its distal margin, is placed a small triangular inner plate with rounded apex, and above this are placed the two outer plates, which are smooth-edged, apically narrowed, the outer margin convex, the inner carrying three minute spinules. All these organs are small, thin in texture, and transparent.

The heart has very thin and delicate walls, apparently with three pairs of venous ostia; it reaches just into the sixth or penultimate segment of the peræon.

First Gnathopods.—Side-plates of this and the following segments shallow, but definitely marked, not overlapping; the coalesced first and second segments having separate side-plates for each segment. The first joint in this and the six following pairs of limbs attached at the lower extremity of the side-plate, longer than the three following joints together, and like them apically encircled with one or two rows of minute denticles, the lateral margins smooth; the second joint not longer than broad; the third a little longer than the second, not *under-riding* the fourth;[1] the fourth joint elongate, a little curved, more than half as long as the first, the hinder margin as in the preceding joint a little furred, the fifth joint more than half the length of the fourth, much narrower, a little curved; the distal part (as is the case with this joint in the other limbs) speckled as if with scale-markings; the finger exceedingly small, acute. This and the six succeeding pairs of legs are all arranged on the same plan, and all for the reception of gland-cells, in particular the muscles of the long first and fourth joints being relegated to a mere corner of the distal end, leaving so large a space vacant as to give a rather peculiar appearance to these transparent limbs.

Second Gnathopods.—Similar to the first but longer. Branchial vesicles quite smooth, oval, a little wider than the first joint and about two-thirds as long. The first three joints of the limb rather stouter and slightly longer than in the first pair; the fourth joint as

[1] The rule laid down by Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 89, footnote, that "the meros *always* overrides the carpos in the pereiopoda and underrides it in the gnathopoda," is of very limited application to the gnathopods of the Hyperina, although so constant in the Gammarina.

long as the third and fourth together of the first pair; the fifth joint also considerably longer than the fifth in that pair.

First Peræopods like the preceding gnathopods except in size and in having the extremities of the first four joints unarmed or almost so. The branchial vesicles larger than the preceding pair in proportion to the greater size of the limb. The first joint wider than in the preceding pair, especially at the distal end; the fourth joint longer than the third and fourth together of the preceding pair, and much wider, its front margin convex, the hinder nearly straight, the distal minutely pectinate; the fifth joint as long as the fourth joint of the first gnathopods, having, as in the gnathopods, some small setules about the apex; the finger very small.

Second Peræopods similar to the first, but a little longer. In the female specimen, the second peræopods have the first joint longer, but the fourth and fifth joints shorter, than the corresponding joints of the first pair.

Third Peræopods.—Side-plates rather broader and branchial vesicles larger than in the preceding pairs, the limbs similar to the preceding pairs but both longer and broader. The first, fourth, and fifth joints are very considerably longer than the corresponding joints in the second peræopods; the fourth joint is but little shorter than the first; the fifth is much narrower than the fourth, and a little over half its length; the finger minute and slender, very little curved, the basal part squared.

Fourth Peræopods.—Side-plates and branchial vesicles similar to the preceding pairs, the limbs shorter. The first joint is a little shorter and above slightly broader than in the third peræopods, the second and third joints similar, the fourth much shorter, not narrower; the fifth shorter and rather broader, the finger similar.

Fifth Peræopods similar to the fourth but shorter, the side-plates not so broad. The first joint not shorter than in the preceding pair, and decidedly wider just below the neck; second and third joints similar, fourth and fifth each much shorter but not narrower; finger similar.

Pleopods.—Peduncles strong, in the first and second pairs longer than the rami, in the third pair about equal to the rami; the coupling spines form a series of from eight to twelve on each pleopod, each spine having only the apical pair of retroverted hooks; there is no cleft spine, this being probably not needed when the coupling spines are so numerous; the first joint of the inner ramus is fringed with the ordinary plumose setæ; the joints of each ramus are eleven or twelve in number, the terminal joints not lengthened. In the female specimen the coupling spines did not exceed five on any pleopod, and the joints of the rami were only six or seven in number.

Uropods.—The peduncles of the first pair are a little longer than those of the third, but not quite so broad; they widen gradually to the distal end; the lanceolate equal rami are about half the length of the peduncle, and where widest about half its greatest breadth; the peduncles of the second pair are shorter than those of the third

and not half as broad; the rami are narrowly lanceolate; the inner about half the length of the peduncle, the outer rather longer; the broad peduncles of the third pair are of almost uniform breadth except near the base; the inner ramus is a third of the length of the peduncle, not twice as long as broad, the outer is rather longer and narrower. All the rami are finely, but more or less irregularly, pectinate on both margins; this is also the case with the inner and distal margins of the peduncles.

Telson small and smooth-edged, broader than long, the sides a little concave, the distal margin rounded, broad, though narrower than the base.

Length, three-tenths of an inch, allowing four-thirtieths of an inch for the measurement from the front of the head to the end of the peræon, and five-thirtieths from the base of the pleon to the extremity of the uropods.

Locality.—April 26, 1876; off St. Vincent, Cape Verde Islands; lat. 16° 49′ N.; long. 25° 14′ W.; surface temperature, 73°·2. Two specimens, male and female.

Remarks.—The specific name is given in compliment to Professor Bovallius, who instituted the genus *Dairella*. From his species *Dairella latissima* of the South Atlantic, the present species is distinguished by the wrist of the first gnathopods not being twice as long as the hand, and by having the peduncles of the first pair of uropods much longer, instead of shorter, than those of the second pair.

In the young ones taken from the mother's pouch, the seven pairs of limbs resemble one another even more closely than in the adult; only the first joint is elongate; in the last three pairs the base of the finger is squared, and the remaining part more slenderly outdrawn than in the preceding pairs; the pleon is strongly flexed against the ventral surface, and several or all of its segments are coalesced, narrowing very gradually to the apex, which is broadly rounded; in this stage no pleopods, uropods, or distinct telson, seem to be developed; no trace of antennæ could be perceived; the mouth-organs occupy nearly the whole breadth of the head, instead of a very small portion of that breadth as in the adult, the outer plate of the first maxillæ shows only a single spine-tooth, and the palp resembles a rounded tubercle.

Genus *Phronima*, Latreille, 1802.

1802. *Phronima*, Latreille, Hist. Nat. gén. et part. des Crust. et des Insectes, vol. iii. p. 38, and (1803), vol. vi. p. 289.
1806. „ Latreille, Genera Crust. et Ins., vol. i.
1810. „ Latreille, Consid. gén. Crust. Arachn. Ins., pp. 103, 422.
1813. „ Leach, Crustaceology, Edinburgh Encyclopædia, vol. vii. p. 403.
1814. „ Leach, Crust. App. Edinburgh Encyclopædia, vol. vii. p. 433.
1815. „ Rafinesque, Analyse de la Nature.
1815. „ Leach, Trans. Linn. Soc. Lond., vol. xi. pt. ii.
1816. *Phronyme*, Latreille, Nouveau Dict. d'hist. nat., t. i. p. 467.

1816. *Phronyma*, Leach, Annulosa, Encyclopædia Britannica, Supplement, p. 424.
1816. *Phronima*, Risso, Hist. nat. des Crust. des env. de Nice, p. 119.
1817. ,, Latreille, Le Règne Animal, t. iii.
1818. ,, Lamarck, Hist. nat. des Anim. sans vertèbres, t. v.
1825. ,, Desmarest, Consid. gén. sur la classe des Crustacés, p. 257.
1825. *Phronime*, Latreille, Fam. nat. du Règne Animal, p. 289.
1828. *Phronima*, Straus-Durckheim, Consid. gén. sur l'anat. comp. des Anim. artic.
1828. ,, Zenker, Das thierische Leben und seine Formen, p. 349.
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1830. ,, Desmarest, Manuel de l'hist. nat. d. crust., t. ii.
1830. ,, Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 394 (pp. 34, 43, extr.).
1832. *Bivonia*, Cocco, Effemeridi scientifiche e letterarie per la Sicilia, t. ii. N. 6, p. 208.
1832. *Phronima*, Zenker, De Gammari Pulicis, Fabr. hist. nat., p. 1.
1835. ,, Milne-Edwards, Crust. dans le jeune âge, Ann. d. Sci. Nat., ser. 2, t. iii.
1836. ,, Guérin, Magasin de Zoologie, vi. Cl. vii. p. 7.
1836. ,, Guérin-Méneville, Iconographie du Règne Animal, t. ii. t. iii. pl. xxv.
1837. ,, Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. ,, Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.
1840. ,, O. G. Costa and A. Costa, Catal. de' Crost. del Regno di Napoli.
1840. ,, Lucas, Hist. nat. des. Crust. Arachn. et Myriap., p. 238.
1840. ,, Milne-Edwards, Hist. nat. des Crustacés, p. 91.
184–. ,, Milne-Edwards, Le Règne Animal (Illustrated Edition).
1850. ,, de Natale, Su pochi Crost. di Messina.
1852. ,, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. ,, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1442.
1853. ,, Costa, Fauna del Regno di Napoli.
1857. *Phronoma*, Spence Bate, Synopsis, Ann. and Mag. Nat. Hist., ser. 2, vol. xix. p. 150 (p. 19, sep. copy).
1857. *Phronima*, Costa, Ricerche sui crost. Amf. del Regno di Napoli, p. 235.
1857. ,, White, Popular Hist. of British Crustacea, p. 208.
1858. ,, Spence Bate, On nidification of Crust., Ann. and Mag. Nat. Hist., ser. 3, vol. i. (p. 8, sep. copy).
1859. ,, Gervais and van Beneden, Zoologie Médicale, t. i.
1861. ,, Pagenstecher, Archiv f. Naturgesch., Jahrg. xxvii. Bd. i. p. 15.
1862. ,, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 316.
1862. ,, Claus, Zeitschr. f. wiss. Zool., Bd. xii. Hft. 2, p. 189.
1863. ,, Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 21.
1864. ,, Fritz Müller, Für Darwin (translation, 1869, pp. 39, 77, 98).
1872. ,, Claus, Zur Naturgesch. der Phron. sedent., Zeitschr. f. wiss. Zool., Bd. xxii. p. 331.
1874. ,, Macdonald, On Anat. and Habits of Phronima, Proc. Roy. Soc. Lond., vol. xxii. p. 154.
1874. ,, Verrill and Smith, Invert. anim. Vineyard Sound, pp. 439, 567.
1875. ,, Powell, Trans. and Proc. New Zealand Inst., vol. vii. p. 294.
1876. ,, Miers, Catal. Crust. New Zealand, p. 129.
1877. ,, Streets, Bulletin U.S. National Museum, No. 7, p. 128.
1878. ,, Claus, Ueber Herz und Gefäss-Syst. der Hyper., Zool. Anzeiger, Jahrgang i. p. 269.
1878. *Phronyma*, Gegenbaur, Grundriss der vergl. Anatomie (translation by Bell).
1878. *Phronima*, Mayer, Mittheil. aus der zool. Station zu Neapel, Bd. i. Hft. 1, p. 40.

1879. *Phronima*, Claus, Der Organismus der Phronimiden, p. 4.
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1881. „ Delage, Appareil circul. des Crust. édriophth. marins, Arch. de Zool. Exp. et Gén., vol. ix. (p. 90, sep. copy).
1881. „ Gordon, The Scottish Naturalist, vol. vi. p. 56.
1882. „ Streets, Study of Phronimidæ N. Pacific, Proc. U.S. Nat. Mus., vol. v. p. 4.
1884. „ Claus, Elementary Text-Book of Zoology (translation by Sedgwick, pp. 452, 455).
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 423.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 488.
1886. „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 150.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 25.
1887. „ Giles, On six new Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. pt. ii. No. 2, p. 212.

For the original definition of the genus, see Note on Latreille, 1802 (p. 72), but this definition is less to the purpose than the original description of the type-species, *Cancer sedentarius*, for which see Note on Forskål, 1775 (p. 38). Forskål speaks of ten feet on each side, explaining that of these twenty feet seven pairs belonged to the thorax. Latreille, thinking apparently only of thoracic feet, changed twenty into ten, and the fifth pair of feet into the third, ignoring the two pairs of gnathopods. What Latreille intended by the "salient setaceous palps" is not quite clear. The mandibles in this genus are without palps in both sexes; the lower antennæ are multiarticulate only in the male. For the definition of the genus by Claus, see Note on Claus, 1879 (p. 487).

Claus, in his Text-Book of Zoology, translation by Sedgwick, 1884, says (p. 455) that the female of *Phronima* "lives with its offspring in *Pyrosoma* and *Diphyidæ*, Mediterranean." This may throw some light on the mysterious genus *Diphyicola*, Costa, 1862.

Phronima pacifica, Streets (Pl. CLIX.).

1877. *Phronima pacifica*, Streets, Bulletin of the U.S. Nat. Mus., No. 7, p. 128.
1882. „ „ Streets, Proc. U.S. Nat. Mus., vol. v. p. 6, pl. i. figs. 3, 3*a*.

Postero-lateral angles of the first three pleon-segments scarcely produced or acute, the third segment not so deep as the second.

The *Eyes*, *Antennæ*, and *Mouth-Organs* agree very nearly with the corresponding parts as figured and described by Claus for *Phronima sedentaria* (Forskål), the differences being of a minute character and in some instances possibly depending only on the particular view obtained of the organs; for example, in our specimen no marginal teeth could be perceived on the finely furred edges of the outer plates of the *Maxillipeds*, but these plates had two little setules at the apex, and two on the outer and one on the inner margin.

First Gnathopods.—First joint nearly as long as the following four, second longer than broad, third scarcely longer than the second, the projecting distal margin straight,

pectinate, with rounded hinder angle; the wrist not longer than the hand, the inner or front margin of the produced hinder apex pectinate; the serrate distal appendages of the hand (*dactyloptera*) nearly reaching to the narrow bent nail of the finger.

Second Gnathopods very similar to the first but longer, the produced apex of the wrist decidedly less than half the length of the hand.

First Peræopods.—First joint armed with two or three setules, one of which is on the minute subapical tooth of the hind margin; the third joint is more than half the length of the fourth, and the fourth is two-thirds the length of the somewhat curved fifth; all these, and the second to some extent also, have the hind margin fringed with hairs; apically the fifth joint is produced into an almost straight pointed process on one side of the minute bent finger.

Second Peræopods.—The branchial vesicles slender, much shorter than the first joint. The marsupial plates much larger than the branchial vesicles. The limb similar to that of the preceding pair, but with all the joints longer and stouter, the first joint having a little projection of the hind margin closer to the actual apex and not produced into a tooth.

Third Peræopods.—Branchial vesicles longer than the preceding pair. The limb shorter than in the preceding pair. The first joint as long as in the second peræopods and a little stouter, distally channelled behind, the hind margin on the outer surface produced into a rather long tooth, which, however, scarcely descends below the front part of the distal margin; the rather broad second joint, which is channelled behind, has the front margin produced into a small apical tooth; the broader and longer third joint has two setules on the very convex hind margin and two on the rather shorter nearly straight front; the massive fourth joint, widening at once from the point of attachment, has a distal breadth more than three-quarters of the length, the hind margin at first very convex, then nearly straight, the front margin slightly sinuous, produced apically into a short curved tooth; between this latter and a second smaller tooth of the distal margin there is a cavity occupying more than a third of that margin, and armed with one setule; a much smaller cavity follows the second tooth, and this is succeeded by a triangular setuliferous margin leading to the hinge of the finger; over this distal border and projecting considerably beyond it closes the finger-like fifth joint, equalling the fourth in length, with convex outer margin and sinuous setuliferous inner or front margin, the convex portion of which partially occupies the larger cavity of the preceding joint; the finger is minute, affixed at the narrow apex of the fifth joint. The form of the fourth joint agrees very nearly with that which Claus figures for the male of *Phronima sedentaria*, except that there the triangular piece of the distal margin near the hinge is subdivided into five little teeth.

Fourth Peræopods.—Branchial vesicles longer than the preceding pair, about as long as the first joint but not nearly so broad. The first joint oval, with the gland-cells

broad, the length of the joint rather less than that of the three following joints together, the little rounded apex of the front margin carrying a setule; the second joint longer than broad, with the distal part of the front margin slightly excavate, having a setule but no tooth at the top of the excavation; the third joint not half the length of the fourth, with an upward directed point at the top of the front margin; the fifth joint longer than the third, shorter than the fourth, straight, slightly tapering, with setules about the apex, which is produced to a point on one side of the finger; the finger minute, with broad base and narrow strongly bent tip.

Fifth Peræopods agreeing with the fourth in the shape of the joints, but differing in their relative proportions; the first joint considerably longer than in the preceding pair, longer than all the other joints together of its own limb, but not so long as the corresponding joints of the fourth peræopods; the third joint more than half the length of the fourth; the fourth not much longer than the fifth.

Pleopods.—Coupling spines small, with an apical pair of retroverted teeth, and a pair below the apex; the cleft spine with very slender arms, the serrate one the longer, the other with a very slight subapical dilatation; the inner ramus with seven joints, of which the first is not very elongate, much excavate at the base on the outer side; the outer ramus with eight or nine joints, the first having a process of the peduncle attached to its surface.

Uropods.—Peduncles of the first pair rather longer and narrower than those of the third, twice as long as the outer ramus, which is a little shorter than the inner; the outer ramus has its inner edge, the inner its outer, finely pectinate; the peduncles of the second pair narrow, about once and a half as long as the outer ramus, which is shorter than that of the preceding pair, the inner margin finely pectinate; the inner ramus almost smooth, or with the pectination of the inner margin scarcely perceptible, narrower than the outer and about half its length; the peduncles of the third pair about twice as long as the outer ramus; the rami as in the first pair, but rather shorter.

The Telson an extremely thin lamina, forming about three-quarters of a circle, affixed to the preceding segment in such a position that its apex only just projects beyond the ventral opening of the segment between the bases of the third uropods.

Length.—Three-tenths of an inch.

Locality.—Station 103, August 22, 1873; off Sierra Leone; lat. 2° 52′ N., long. 17° 0′ W.; surface-net, 100 fathoms; surface temperature, 77°. One specimen, female.

Remarks.—It is perhaps a rather significant circumstance that the specimen of *Phronima pacifica* should come from the Atlantic, while the specimens which I have been led to assign to *Phronima atlantica* come from the Pacific.

Phronima atlantica, Guérin (Pl. CLX.).

1836.	*Phronima atlantica*,	Guérin, Mag. Zool., vi. Cl. vii. p. 7, pl. xviii. fig. 1.
1836.	,, ,,	Guérin-Méneville, Icon. du règne anim., Crust., pl. xxv. fig. 4.
1840.	,, ,,	Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 93.
1852.	,, ,,	Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 1001.
1862.	,, ,,	Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 318, pl. li. fig. 4.
1882.	,, ,,	Streets, Proc. U.S. Nat. Mus., p. 5, pl. i. figs. 1, 1*a*, 2.

Last segment of the peræon elongate, a little longer than the first of the pleon, which is much longer than either of the two following; the first three segments of the pleon with the postero-lateral angles produced in the female, the tooth being longer in the second than in the first, and in the third than in the second segment; in the male specimen only the third segment had a tooth and that a small one.

First and *Second Peræopods* with the hind margin of the first and second joints apically produced to form an acute slender tooth. In the male this tooth seems to be unimportant in size.

Third Peræopods.—First joint very little expanded below, each margin having a pointed apex; the second joint having the front margin produced into a pointed apex, this joint being as long as the third in the male specimen, but much shorter in the female; the third joint little dilated; the fourth considerably longer in the female than the distal breadth, the front margin forming only a small apical tooth, separated by an almost semicircular cavity from a much smaller tooth which projects from the palmar margin almost as far as the front tooth; a second much smaller cavity reaches the centre of the palm, the margin of which beyond this cavity is at first either crenate or cut into two or three little teeth; in the male this joint differs only in being a little broader near the base and shorter in proportion to the breadth; the fifth joint is much bent, almost as long as the fourth, with a slight bulge near the centre of the inner or front margin, the bulge being nearer the apex in the male than it is in the female; the finger as usual minute.

Fourth Peræopods.—Branchial vesicles not quite so long as the first joint. The first joint with the two lines of gland-cells very distinct, each line divided into four elongate packets; the front margin of the joint apically produced into a narrow acute tooth, less developed in the male than in the female; front margin of the second joint produced into a projecting tooth.

Fifth Peræopods similar to the fourth, with the usual differences in the proportions.

Pleopods.—Peduncles elongate, the inner ramus with seven, the outer with eight joints; the first joint in each ramus nearly as long as the rest together.

Uropods in agreement with those of *Phronima pacifica*, Streets, except that in the female the inner ramus of the second pair is much more than half the length of the outer,

with a very fine but obvious pectination; in the male specimen this ramus was smaller, and on one side of the animal little more than a tubercle, though on the other side it was more than half the length of the outer ramus and apically acute.

Telson wider than deep, the curved distal margin scarcely projecting between the bases of the third uropods, the texture so thin as to make its outline difficult to observe. Guérin says that the telson is triangular, but this may refer to the profile view, as in the dorsal view he makes it curved; in both views he draws the fifth and sixth segments of the pleon as separate, and he treats them as distinct in the description; there can be little doubt that this is an error of observation.

Length of the female specimen half an inch, of the male seven-twentieths of an inch.

Locality.—Station 245; June 30, 1876; between Japan and Honolulu; lat. 36° 23′ N., long. 174° 31′ E.; surface temperature, 69°. Two specimens, female and young male.

Remarks.—From the same locality there are two other specimens of *Phronima*, very small, one, by more swollen upper and the budding lower antennæ, shown to be a young male, this scarcely a quarter of an inch long, and the other about one-fifth; in each, the fourth joint of the third peræopods is distally wide, with a narrowly produced incurved apex to the front margin, and two little subequal teeth on the distal margin; the fifth joint bulges a good deal where its inner or front margin meets the cavity of the fourth joint's distal margin.

In Guérin's figure of this species the gnathopods are represented as linear, without any prolongation of the wrist. Milne-Edwards, probably judging only by the figure, says, "pates des deux premières paires grêles et sans élargissement vers le bout." There can be little doubt, however, that Guérin represents them as seen edgewise, and that he left them undescribed because he had not made out the details. In the Brit. Mus. Catal. Amph. Crust., pl. 51, Guérin's figure is reproduced, and close to it is placed a figure marked 4*i*, as if to represent the second gnathopods; but this figure has not really anything to do with *Phronima atlantica*, having been accidentally transferred from Guérin's *Oxycephalus oceanicus*. In regard to specimens from the "Atlantic, latitude 7° or 8° north, and longitude about 24° west," Dana only says, "the figure of Guérin represents our specimens correctly in most respects. The moveable finger of the large hand has a low tooth on its inner side, one-third of the distance from its base to its apex; and the immoveable finger is longer, with a prominent angle near the articulation with the moveable finger." A species named *Phronima spinosa* by Bovallius in 1887, found in "tropical parts of the Atlantic," does not seem to differ much from Guérin's except that it is said to have the first joint of the fifth peræopods nearly twice as long as that of the fourth pair.

Phronima megalodous, n. sp. (Pl. CLXII., A.).

Seventh segment of the peræon longer than the first of the pleon; postero-lateral angles of the first three segments of the pleon acute. Branchial vesicles respectively longer and broader than the first joints of the limbs.

First Gnathopods.—The produced wrist longer than the hand, its distal margin very sinuous, the produced hinder apex not half the length of the hand, its convex inner or front margin very regularly pectinate; the hand very scabrous.

The First and *Second Peræopods* with hind margin in the first and second joints only slightly prominent just above the apex, not at all produced or acute.

Third Peræopods.—As usual the first and second joints are thickened and more or less channelled behind and sharp-edged in front, while in the third joint and in the fourth at its upper part the hinder margin is sharp, the front of these joints being broad. The first joint is large, widening considerably as it approaches the distal end, where the hind margin of the outer surface forms an angle but is not produced into a tooth; the front margin of the second joint forms a tolerably acute apical tooth; the third joint is rather longer than the second, with a narrow neck, below which the hind margin is very convex, the front straight with rounded apex; the fourth joint is as long as the first, twice as long as its greatest breadth, the neck narrow, the front margin sinuous, distally forming a considerable tooth which may be reckoned as about a fourth of the total length of the joint; a deep cavity separates this tooth from one not much smaller occupying the centre of the palm, its front edge smooth, its longer hinder margin being distally divided into five little teeth or crenulate compartments; beyond this the palm has a rather irregular course, but without teeth, on either side of the base of the following joint; the finger-like fifth joint is curved, not so long as the fourth joint, but when closed upon it projecting much beyond the front tooth of that joint, having its front or inner margin a little bulging and crenate for a short space where it begins to emerge beyond the tooth; the finger is as usual minute and strongly bent. On the inner surface of the fourth joint between the bases of the two teeth there is a little rounded process carrying a setule.

Fourth Peræopods.—The first joint considerably shorter than in the preceding pair, as long as the three following joints together, with a minutely produced apex of the front margin; second joint of the front margin strongly bent, and excavate below the quasi-apical angle; the third joint longer but much narrower than the second, the upturned angle at the top of the front margin not strongly produced, the distal margin as usual oblique; the fourth joint considerably more than twice as long as the third, and nearly twice as long as the fifth.

Fifth Peræopods similar to the fourth, but with the first joint much longer, the others shorter, especially the third and fourth; the fourth joint nearly twice as long as the third, and considerably longer than the fifth.

Length, four-fifths of an inch.

Locality.—April 26, 1876; off St. Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface, night; surface temperature, 73°·2. One specimen, female.

Remarks.—The specific name is derived from the Greek word μεγαλόδους, meaning with a large tooth, and refers to the unusually large tooth on the centre of the palm in the third peræopods.

Akin to the present species, and perhaps identical with it, are two specimens labelled "Pacific, Api to Cape York, surface."

In the female specimen the marsupial plates are only slightly developed, and as compared with the Atlantic specimen just described, the fourth joint in the third peræopods is more elongate, the front tooth much larger than that at the centre of the palm, the fifth joint more stumpy, very much shorter than the fourth. The length more than half an inch.

The male specimen accompanying this female is only a quarter of an inch long, and far less than a quarter of the bulk of the female, so that it might have been regarded as a young one, but on examination the antennæ proved to be those of an adult, the upper with a long thick first joint to the flagellum, having a large bush of filaments, and the following joints slender, the lower with numerous filiform joints; in this specimen the fourth joint of the third peræopods is distally as broad as its length, the front apical tooth not very long, the palmar margin having no very deep cavity and at about the centre two separate nearly equal teeth, not very large, inclined towards the hinge of the following joint; the fifth joint has a very slight bulge of its inner margin between the two teeth just mentioned, and with the finger only just reaches the tip of the front tooth of the fourth joint.

A specimen, female, from Station 227, March 27, 1875; between Papua and Japan; lat. 17° 29′ N., long. 141° 21′ E.; surface temperature, 79°·2, appears also to belong to this form or species.

In the Brit. Mus. Catal. Amph. Crust., pl. 51, fig. 2, a form is represented which shows much resemblance to the present species, and which is there named *Phronima custos*, Risso, although, as Mr. Spence Bate had not seen the typical specimens of that species, he gives the name with some reserve. His figure does not in fact agree with Risso's, which is here copied in the Note on Risso, 1816 (p. 97), and which is also copied in Desmarest's Consid. gén. sur la classe des Crust., pl. 45, fig. 1, in Lucas' Hist. Nat. des Crust., pl. 18, fig. 6, and in White's Popular Hist. of Brit. Crust., pl. xi. fig. 4, but by all these authors named *Phronima sedentaria*, without reference to Risso.

Phronima tenella, n. sp. (Pl. CLXI., A.).

Last segment of the peræon not very elongate, longer than the first of the pleon; postero-lateral angles of the first three segments of the pleon scarcely produced, those of the third segment forming an acute point.

Upper Antennæ.—The peduncle short, the first joint not longer than broad, but longer than the two following together; the first joint of the flagellum very elongate, the brush composed of more than forty rows of filaments, the apex of the joint produced to a point which almost reaches the apex of the third joint; the second joint not half the breadth of the first, not longer than broad, carrying three groups of filaments; the third joint narrower, also carrying filaments; the fourth, fifth, and sixth joints successively narrower and longer; the two terminal joints also narrow, neither of them longer than the sixth.

Lower Antennæ.—Although the upper pair are so powerfully developed, the lower, as far as can be seen in the mounted specimen, consist each of a single narrow joint.

The Gnathopods are nearly of the usual character, the wrist not longer than the hand, with the produced portion very short.

The First and *Second Peræopods* have the hind margin of the first and second joints produced apically into a narrow acute tooth.

Third Peræopods.—There is an acute tooth at the apex both of the front and the hind margin, that on the front the smaller and lower; the second joint has its front margin produced into an acute tooth; the fourth joint is considerably longer than its greatest breadth, the small apical tooth of the front margin not reaching so far as the much smaller tooth within the palm, this tooth being separated from it by a narrow but deep cavity, and followed by a small cavity, beyond which comes the usual crenulate margin leading towards the hinge; the fifth joint is subequal in length to the fourth, curved, with a very slight bulging of the smooth inner margin in one of the limbs, while in the other this margin is simply concave; the finger is minute, of the usual form.

Fourth Peræopods.—The first joint rather longer than the branchial vesicles, not quite so long as the first joint in the third pair, the front margin produced into a sharp narrow tooth; the second joint much narrower than the first, apically produced into a sharp tooth in front; the third joint having a small sharp tooth at the top in front; the fourth joint more than twice the length of the third.

Fifth Peræopods similar to the fourth, with the usual variations in the length of the joints, and the first joint broader than the broad first joint of the preceding pair, the teeth of the first, second, and third joints somewhat more pronounced. The male genital organs which have their opening in the seventh peræon-segment are fully developed and conspicuous through the transparent integument.

Pleopods.—Peduncles broad; ten joints in each ramus, the first not very long.

Uropods.—The inner ramus of the second pair more than half the length of the outer, not reaching to the apex of the peduncle of the first pair, while the outer ramus reaches beyond that apex.

Length, without the antennæ, rather more than two-fifths of an inch.

Locality.—Station 272, September 8, 1875, Mid Pacific; lat. 3° 48′ S., long.

152° 56′ W.; surface net; surface temperature, 79°. One specimen, male, mounted in Canada balsam.

Remarks.—The specific name refers to the delicacy of structure displayed by the specimen, the fourth joint of the third peræopods in especial not having the squareness common in the males of this genus.

Phronima novæ-zealandiæ (*?*), Powell (Pl. CLXI., B.).

1875. *Phronima novæ-zealandiæ*, Powell, Trans. and Proc. N. Z. Inst., 1874, vol. vii. p. 294, pl. xxi. figs. 1, 2.
1876. „ „ Miers, Catal. Stalk- and Sessile-eyed Crust. New Zealand, p. 129.
1886. „ *neo-zelanica*, Thomson and Chilton, Trans. N. Z. Inst., vol. xviii. p. 150.

The specimen which I take to represent Mr. Powell's species has the postero-lateral angles of the first three pleon-segments strongly produced. The first and second joints of the first peræopods are not apically produced. The fourth peræopods agree closely with those figured for *Phronima megalodous*, Pl. CLXII., A. The third peræopods do not differ to any great extent from those figured on Pl. CLXII., B, for *Phronima sedentaria*, although the front tooth of the fourth joint is less elongated; but, judging by specimens kindly sent me from New Zealand by Mr. G. M. Thomson, that, as might be expected, is not a specific characteristic; moreover, a large specimen taken south of Australia, March 9 and 10, 1874, and presumably belonging to this species, has the front tooth in question elongate. The peduncles and rami of the first uropods are the longest, and respectively nearly reach back as far as those of the third uropods; the inner and the outer ramus in each pair are equal, and have the adjacent margins pectinate; the rami of the second pair are shorter than those of the third, and reach just beyond the peduncles of the first pair. The telson is semicircular.

Length, one inch.

Locality.—Station 158, March 7, 1874; in the Southern Ocean; lat. 50° 1′ S., long. 123° 4′ E.; depth, 1800 fathoms; bottom temperature, 33°·5; surface temperature, 45°. One specimen, female, containing eggs.

Remarks.—The interest of the specimen does not so much depend on the question of its right to this or that specific name, as on the latitude from which it comes. If it actually came from the depth named, it must be capable of bearing a very low temperature, and it will be observed that even the surface temperature of the station is not very high. The identity, however, of *Phronima novæ-zealandiæ* with *Phronima borneensis*, Spence Bate, and of both with *Phronima sedentaria*, seems well within the bounds of probability.

Phronima sedentaria (Forskål) (Pl. CLXII., B.).

1775. *Cancer sedentarius*, Forskål, Descr. Anim. quæ in itin. orient. observavit, p. 95.
1776. „ „ Forskål, Icones rerum nat. quas in itin. orient. depingi curavit., tab. xli. fig. D, d.
1796. *Cancer* (*Gammarellus*) *sedentarius*, Herbst, Naturgesch. der Krabben und Krebse, Bd. ii. p. 136, tab. xxxvi. fig. 8.
1802. *Gammarus sedentarius*, Schousboe, Skrivter af Naturhist.-Selskabet, Bd. v. Hfte. 2.
1802. *Phronima sedentarius*,[1] Latreille, Hist. Nat. des Crust. et des Insectes, vol. iii.

A specimen, which seems to agree with this species as well as any in the collection, is figured on the Plate of the natural size. An enlarged figure of the third peræopod is given for comparison with one drawn to the same scale of that peræopod in *Phronima megalodous*. The third peræopod of a young one taken along with the large specimen is also given, drawn to the same scale, and a figure of the terminal portion of the same peræopod much more enlarged.

Length, from the front of the head to the apex of the third pleon-segment, an inch and a quarter; the full length quite an inch and a half.

Locality.—Station 232, May 12, 1875; the *Hyalonema*-ground, Japan; lat. 35° 11′ N., long. 139° 28′ E.; depth, 345 fathoms; bottom temperature, 41°·1; surface temperature, 64°·2. One specimen, female, with young.

Remarks.—From the very extended distribution of the genus *Phronima* there arises a probability that it may include several species, but to establish clear marks of discrimination between the species is likely to require very extended research. Though it is easy to distinguish the adult males from the adult females, there are stages of growth when the two sexes are closely alike, and it is quite possible that some species when full grown present a close resemblance to the earlier stages in other species. The available marks depend to a great extent on the lengthening and shortening, the sharpening or rounding, of this apex or of that, on the question whether one tooth is more or less distant from another, or whether a margin is denticulate or crenulate. But all these marks are liable to so much variation, whether dependent (as may be the case) on the individual, or (as is certainly the case) on age and sex, that determinations of species are of necessity very problematical. Even if the limits of variation within any one species were definitely known, it is quite possible that in some of the stages it might be practically indistinguishable from some stage of a different species. In the young ones a tenth of an inch long, from the specimen taken south of Australia, March 9 and 10, 1874, the dactyloptera of the gnathopods were found to be very short, and the broad fourth joint of the third peræopods scarcely longer than the distal width, armed only with a minute front tooth;

[1] Most of the references given in the synonymy of the genus *Phronima* have to do with *Phronima sedentaria*, Latreille, so that it is scarcely worth while to repeat the list.

on the other hand, young ones from the specimen taken at Station 232 showed the dactyloptera well developed, the fourth joint of the third peræopods considerably longer than the distal breadth, and the distal margin divided as in *Phronima atlantica*, Guérin, Pl. CLX., fig. *prp*.3, ♀; but then these specimens proved to be a little more than a tenth of an inch long, and when one was examined that was not more than a tenth of an inch, the distal margin of the fourth joint of the third peræopods was found to be armed only with a minute front tooth, just as in the specimens taken at a distance of 83° to the south. To give a full account of the Challenger specimens would demand a treatise by itself. It may be of interest, here, without the treatise, to mention the various localities at which specimens of the genus were obtained, whatever the species may be to which they respectively belong.

Station 103, August 22, 1873; off Sierra Leone; lat 2° 52′ N., long. 17° 0′ W. (*Phronima pacifica*, see p. 1348).

Station 106, August 25, 1873; east of St. Paul's Rocks; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms; surface temperature, 78°·8. Two specimens, female.

September 29, off Rio Janeiro; lat. 19° 6′ S., long. 35° 40′ W.; surface, night; surface temperature, 74°·7. One specimen.

Station 130, October 3, 1873; south-east of Rio Janeiro; lat. 26°15′ S., long. 32° 56′ W; surface temperature, 69°.

Station 131, October 6, 1873; South Atlantic; lat. 29° 35′ S., long 28° 9′ W.; surface temperature, 65°. One male specimen, mounted in Canada balsam. Length, seven-twentieths of an inch. Flagellum of the upper antennæ with very long first joint, followed by six small joints; flagellum of lower antennæ with twelve long slender joints; of the second uropods the inner ramus almost as long as the outer. The third peræopods have the square form of wrist, with the hand projecting but little beyond it (*? Phronima pacifica*).

Station 132, October 10, 1873; South Atlantic; lat. 35° 25′ S., long. 23° 40′ W.; surface temperature, 58°. One male specimen, mounted in Canada balsam. Length, half an inch. The antennæ and uropods nearly as in the specimen from Station 131; the third peræopods with the wrist longer than broad, like that figured for the *female* of *Phronima atlantica* on Pl. CLX., the hand projecting much beyond the wrist.

Station 158, March 7, 1874; in the Southern Ocean; lat. 50° 1′ S., long. 123° 4′ E.; depth, 1800 fathoms; bottom temperature, 33°·5; surface temperature, 45°. One specimen, an inch long, female, with eggs (*? Phronima novæ-zealandiæ*, see p. 1356). A *Phronima*-house.

March 9 and 10, 1874; south of Australia; lat. 48° 18′ S., long. 130° 4′ E.; surface; surface temperature, 50°. One large specimen, female, in its house, with numerous young. One empty *Phronima*-house.

Station 159, March 10, 1874; south of Australia; lat. 47° 25′ S., long. 130° 22′ E.; surface temperature, 51°·5.

Station 196, October 13, 1874; north of Amboina; lat. 0° 48′ 30″ S., long. 126° 58′ 30″ E.; depth, 825 fathoms; bottom temperature, 36°·9; surface temperature, 83°. One large specimen, an inch and a quarter long, female, with young; both the large claws broken off. Two of the *Phronima*-houses.

Station 227, March 27, 1875; between Papua and Japan; lat. 17° 29′ N., long. 141° 21′ E.; surface; surface temperature, 79°·2. One specimen, female (*? Phronima megalodous*).

April 3, 1875; North Pacific, south of Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. One specimen, a fifth of an inch long, male, with the antennæ not fully developed.

April 4, 1875; North Pacific, south of Japan; lat. 25° 33′ N., long. 137° 57′ E.; surface; surface temperature, 69°. One specimen, female.

Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. One specimen, female (*? Phronima megalodous*).

Station 232, May 12, 1875; the *Hyalonema*-ground, Japan; lat. 35° 11′ N., long. 139° 28′ E.; depth, 345 fathoms; bottom temperature, 41°·1; surface temperature, 64°·2. One specimen, female, with numerous young (*Phronima sedentaria*). Two *Phronima*-houses.

Station 235, June 4, 1878; off Japan; lat. 34° 7′ N., long. 138° 0′ E.; depth, 565 fathoms; bottom temperature, 38°·1; surface temperature, 73°. One specimen, female, more than an inch long.

Station 240, June 21, 1875; east of Japan; lat. 35° 20′ N., long. 153° 39′ E.; surface; surface temperature, 64°·8. One specimen, male.

Station 241, June 23, 1875; east of Japan; lat. 35° 41′ N., long. 157° 4′ E.; surface; surface temperature, 69°·2. One specimen, male, three-tenths of an inch long (*? Phronima atlantica*).

Station 244, June 28, 1875; North Pacific; lat. 35° 22′ N., long. 169° 53′ E.; surface; surface temperature, 70°·5. One specimen, male, about a quarter of an inch long (*? Phronima atlantica*).

Station 245, June 30, 1875; North Pacific; lat. 36° 23′ N., long. 174° 31′ E.; surface temperature, 69°. Five specimens (*Phronima atlantica*, see p. 1351).

July 4, 1875; Mid North Pacific; lat. 36° 42′ N., long. 179° 50′ W.; surface, night; surface temperature, 61°·5. Several small specimens.

July 1875, between Japan and Honolulu; lat. 35° N.; surface. Several specimens of both sexes and various sizes, none very large. Also about the same locality twelve specimens; one an adult female, one inch long, with third peræopods nearly as in Pl. CLXII., B.; of the rest the longest nine-tenths of an inch, six of the specimens being females not adult, the other five males, and of these five two with both pairs of antennæ fully developed.

August and September 1875; Pacific Ocean; lat. 7° 35′–5° 54′ N., long. 149° 49′–147° 2′ W.; surface; surface temperature, 81°. One specimen, female, seventeen-twentieths of an inch long.

Station 272, September 8, 1875; Mid Pacific Ocean; lat. 3° 48′ S., long. 152° 56′ W.; surface temperature, 79°. (*Phronima tenella*, see p. 1355.)

September 15, 1875; Mid Pacific Ocean; lat. 12° 8′ S., long. 150° 13′ W.; surface; surface temperature, 75°. One specimen, female.

October 1875; South Pacific, between Tahiti and Juan Fernandez; surface. One specimen, female, agreeing in the shape of the third peræopods very exactly with Guérin's figure, in the Magasin de Zoologie, of *Phronima atlantica*, with bifid tooth on the fourth joint; this specimen is about three-quarters of an inch long, and has very small marsupial plates, which look like little branchial vesicles, adjoining the second gnathopods and first two pairs of peræopods.

Station 295, November 5, 1875; South Pacific; lat. 38° 7′ S., long. 94° 4′ W.; surface, night; surface temperature, 58°·5. One specimen, male.

Station 323, February 28, 1876; Atlantic, off Monte Video; lat. 35° 39′ S., long. 50° 47′ W.; surface; surface temperature, 73°·5. One specimen, young.

March 5, 1876; South Atlantic; lat. 37° 32′ S., long. 42° 0′ W.; surface; surface temperature, 70°·5. One specimen, male.

Station 335, March 16, 1876; South Atlantic, north of Tristan da Cunha; lat. 32° 24′ S., long. 13° 5′ W.; surface; surface temperature, 73°·5. One specimen, mounted.

Station 351, April 12, 1876; Atlantic, off coast of Africa; lat. 9° 9′ N., long. 16° 41′ W.; surface; surface temperature, 81°·8. One specimen, female (*Phronima pacifica*).

April 26, 1876; off St. Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface, night. (*Phronima megalodous*, see p. 1353.)

Station 354, May 6, 1876; North Atlantic; lat. 32° 41′ N., long. 36° 6′ W.; depth, 1675 fathoms; deep trawl; bottom temperature, 37°·8. One specimen, female, mounted in Canada balsam.

May 7, 1876; North Atlantic, south-west of the Azores; lat. 34° 22′ N., long. 34° 92′ W.; surface, night; surface temperature, 67°·5. A female, not full grown.

Other labels were given as follows, with the Stations indeterminate :—

"Atlantic, surface." Seven specimens, all females, two large ones in their houses, one large one free, about an inch and one-fifth long, the other four smaller, but all of them over three-fifths of an inch.

"Surface, between Bermuda and Azores." One specimen, female.

"Pacific, Api to Cape York, surface." Two specimens, a male and female (see p. 1354, on *Phronima megalodous*).

"Phronimid, Pacific, Admiralty Islands to Japan." One specimen, male. Length, less than a fifth of an inch; the flagellum of the upper antennæ with the first joint large,

not produced along the second joint, which like the third and last is small; the flagellum of the lower antennæ has a long first joint followed by eight or ten short ones.

"Surface, Sydney to Wellington." One specimen, female. A large *Phronima*-house.

"Japan to Honolulu."

The range of the genus as illustrated by the Challenger specimens is, therefore, between lat. 36° 23′ N. and 50° 1′ S., and over a space of 223 degrees between long. 13° 5′ W. and 123° 4′ E. Specimens from the Shetland Isles obtained by Dr. Fleming and Dr. Johnston (Brit. Sess. Crust., vol. ii. p. 26) carry the range in latitude up to 60° N. in the Atlantic; Dr. Streets extends it to 40° N. in the Pacific; and since Dr. Giles has added the Bay of Bengal to so many other localities from which the genus is known, its range from east to west may fairly be considered as extending all round the world.

Genus *Phronimella*, Claus, 1871.

1862. *Phronima* (*pars*), Claus, Zeitschr. f. wiss. Zool., Bd. xii. Hft. 2, p. 193.
1862. „ „ Claus, Würzburger naturwiss. Zeitschr., Bd. iii. p. 247.
1871. *Phronimella*, Claus, Untersuch. über den Bau und die Verwandschaft der Hyperiden.
1872. „ Claus, Zur Naturgesch. der Phronima sedentaria, Zeitschr. f. wiss. Zool., Bd. xxii. p. 333.
1877. *Anchylonyx*, Streets, Bulletin U.S. Nat. Mus., No. 7, p. 130.
1878. *Phronimella*, Claus, Zool. Anzeiger, Jahrg. i. No. 12, p. 269.
1879. „ Claus, Der Organismus der Phronimiden, p. 4.
1882. „ Streets, Proc. U.S. Nat. Mus., vol. v. p. 8.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 423.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 489.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 26.
1887. „ Giles, On six new Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. pt. ii. No. 2, p. 214.

For what is practically the original definition of the genus as far as Claus is concerned, see Note on Claus, 1879 (p. 487). For the definition of *Anchylonyx*, see Note on Streets, 1877 (p. 470). The definition which Claus gave of the species *Phronima elongata* in 1862 was as follows:—

"Body slender and delicate. The pleon very elongate with three pairs of pleopods and two pairs of uropods. Limbs of the peræon very thin and weak, the third and still more the fourth [*First* and *Second Peræopods*] almost whip-like in elongation; the fifth [*Third Peræopods*] are not chelate but subchelate." He shortly afterwards noted that the first peræopods were longer than the second, and that the second pair of uropods attained to some development in the male; but in the definition of the genus in 1879 these points seem to have been again overlooked. Bovallius in 1887 adds a new species, *Phronimella filiformis*, from the South Atlantic, which may be distinct, but there is nothing in the very brief description to separate it from *Anchylonyx hamatus* as described by Streets in 1877, a species which Streets himself identifies with *Phronimella elongata*.

Phronimella elongata, Claus[1] (Pl. CLXIII.). Specimens A, B.

Male.—The first two (coalesced) segments of the peræon not longer than the third but deeper; the seventh segment longer than any of the preceding, distally narrowed; the first three segments of the pleon deeper than the last of the peræon, the first the longest, the second the deepest, the third the shortest, the postero-lateral angles of all produced into a minute tooth, the lower margin in the second and third very convex.

Eyes answering the generic description.

Upper Antennæ.—The peduncle not very long, the first joint the widest, wider than long, the two following joints about equal to one another, together not so long as the first; the first joint of the flagellum of great length, longer than the five following slender joints together, narrowing a little distally, the apex produced to a point beyond the second joint, the whole breast covered with a brush of long slender filaments; the fourth joint longer than the second or third, the fifth longer than the fourth, the two following each shorter than the fifth, all bordered with short filaments at intervals; the remainder of the flagellum missing.

Lower Antennæ.—Gland-cone projecting from the wall of the head, third (first free) joint of the peduncle much narrower than the peduncle of the upper antennæ, longer than broad, a little widened distally, fourth joint shorter, fifth joint narrower than fourth, narrowing distally, as long as the third; flagellum abruptly narrower than the peduncle, very long and filiform, containing in the specimen examined about twelve elongate joints carrying slender filaments, the last joint ending bluntly.

First Gnathopods.—The first joint longer than the others together, the margins smooth and nearly parallel, the muscles occupying only a small space at the distal end of the joint; the second joint longer than broad; the third not longer than the second, distally a little projecting but not produced behind the fourth joint, its convex margin being here faintly scabrous, and carrying one hair or spinule; the wrist elongate, longer than the two preceding joints together, equal in length to the hand, widening a little distally, the front margin almost straight, the hind margin a little before the apex produced into a narrow tooth carrying a spinule, the arched cavity between this and the apex being scabrous; the hand narrow, slightly bent, carrying a few hairs or spinules, the dactyloptera at its extremity of great tenuity, reaching to the middle of the finger; the finger small and curved, not half the length of the hand, narrowing rather abruptly near the base and again at the insertion of the slender nail; the figure gives a ventral view, in which the finger appears almost straight; the dactyloptera are difficult to see in full; they appear to be oval, smooth-edged, with longitudinal markings which may be due to an optical effect of the transparent concave surface.

[1] The references for the species are practically the same as those already given for the genus.

Second Gnathopods similar to the first but longer; the first, second, and third joints a little longer and very noticeably wider than in the preceding pair; the fourth, fifth, and sixth joints very decidedly longer; from the tendency in this pair to turn back towards the mouth-organs, it is not easy to lay them flat for a profile view, and in a ventral view the tooth near the apex of the wrist does not project, so that the joint appears altogether linear.

First Peræopods.—A narrow tooth or process projects from the segment above each of these limbs, which are very much longer and broader than the gnathopods. The first joint not quite so long as the third and fourth together, its front margin straight and smooth, the hind margin with one or sometimes two little teeth; the second joint longer than broad; the third more than twice as long as the second, with its hind margin nearly straight, the front a little convex; the fourth joint not twice as long as the third; the fifth joint narrow, tapering, almost straight, nearly three times as long as the third, produced into a spine-like process along the proximal half of the minute finger; there are small setules or hairs at intervals along the hind margin of the limb.

Second Peræopods.—Branchial vesicles narrowly oval, less than half the length of the first joint. The first joint broader and a little longer than in the preceding pair, the hind margin having a tooth at the centre (or, as on one of the limbs, below the centre), another at the apex, and two intermediate; the second joint with the apex of the hind margin slightly acute; the third and fourth joints nearly as in the preceding pair, the fifth joint only equal in length to the fourth, otherwise with the finger as in the preceding peræopods.

Third Peræopods.—Branchial vesicles rather larger than the preceding pair. First joint a little longer and much wider than in the second peræopods, the front margin having six or seven little teeth, the hinder margin smooth, but dividing near the apex to form two little apical teeth; the second joint comparatively stout, with two little teeth on the front margin; the third joint not twice the length of the second, with convex hind margin, the front margin having three or four teeth, the lowest the largest; fourth joint less than twice the length of the third, with smoothly convex hind margin, the front margin having six or seven unequal teeth; the joint widens downwards to the fourth and largest tooth, below this having two or three teeth, on what may be considered as the palm margin; the anterior distal part of the joint containing gland-cells; the fifth joint finger-like, slender, curved, about three-quarters the length of the fourth joint, the largest tooth of which could impinge against the fifth joint about at its centre; the finger minute, sharp-tipped, thick at the base, which is inserted in the narrowed apex of the fifth joint.

Fourth Peræopods.—Branchial vesicles rather larger than the preceding pair. First joint of the limb shorter than in the first peræopods but rather wider, longer than the three following joints together, the margins convex and smooth, the front one having a little

apical tooth; the second joint not longer than broad, with a front apical tooth; the third joint narrower than the second, not twice as long; the fourth slightly curved, more than twice as long as the second; the fifth slender, nearly twice as long as the third; distally armed as in the first and second pairs; the front margin of the third, fourth, and fifth joints scabrous; the finger minute, bulbous at the base.

Fifth Peræopods similar to the fourth, but with different relative proportions, the first joint being rather longer than in the preceding pair, considerably longer than all the following joints together, all of which are inferior both in length and breadth to the corresponding joints in the fourth peræopods, so that in total length these limbs are the shortest of the peræopods, though longer than the gnathopods. Arranged in gradation according to length, the order of the limbs would be *gn.*1., *gn.*2., *prp.*5., *prp.*4., *prp.*3., *prp.*2., *prp.*1.

Pleopods.—Peduncles broadly oval, as usual the second pair shorter than the first and the third than the second; the coupling spines short and tolerably stout, the apex acute, with a pair of retroverted teeth, below which a second pair are placed, one tooth occupying each margin; in the first pair of pleopods there are three coupling spines; the cleft spine having the arm with the expanded apex rather the shorter; the rami shorter than the peduncles, with six or seven joints to the inner, and seven or eight to the outer ramus.

Uropods.—The peduncles narrow, longer than the rami, smooth edged; the rami narrowly lanceolate, the outer finely pectinate on the inner margin, the inner on the outer margin; in the first pair the peduncles slightly longer and narrower than those of the third pair, the outer ramus scarcely longer than the inner; the two rami slightly apart at their bases; the peduncles of the second pair much narrower than those of the first, and a little more than half the length, the outer ramus being also much shorter and narrower than the rami of the other pairs, the inner ramus represented only by a produced rather blunt tooth or process of the peduncle; the rami of the third pair almost equal, the outer perhaps a little the longer.

Telson nearly semicircular, of extreme tenuity, and therefore very difficult to perceive, especially as, owing to its very small size, it does not project beyond the divided margin of the ventral opening.

Length.—In a straight line from the front of the head to the extremity of the uropods, the specimen measured, in the position figured, three-tenths of an inch.

Female.—The seventh segment of the peræon more elongated than in the male and the dorsal emargination of the distal end more conspicuous; the first three segments of the pleon more elongate in proportion to their depth and differently shaped, widening a little distally, with the postero-lateral angles sharply produced into pronounced teeth, another little tooth standing a little higher up on the hind margin, this tooth being

indeed represented in the male, but standing at a greater distance from the postero-lateral angle and being very faintly marked; in the female there is very little convexity in either the upper or lower margin of these segments.

Upper Antennæ two-jointed, the first joint rather thicker than the second, but not half as long, the second joint widening a little for some distance, then narrowing and carrying three or four pairs of filaments, the apex blunt or truncate.

Lower Antennæ only represented by the semicircular rudiment swelling out on each side of the head just below the lateral eye; from the lower part there is a little projection containing the opening of the gland-cone.

Maxillipeds.—The inner plate rudimentary; the sinuous inner margin of the outer plates carries five conspicuous spaced denticles, followed by two smaller close together, and these again by a finely pectinate tract, while the narrowed apical portion is almost smooth, the blunt end having a setule; there are also two setules on the surface below the apex.

Gnathopods differing little from those of the male.

Peræopods more elongate than in the male; in the first and second peræopods the length of the third joint is much greater as compared with the second joint; the second peræopods are much shorter than the first, the difference in size being very marked in the fourth joint as well as in the fifth.

Third Peræopods.—First joint much longer than in the preceding pair, narrower than in the male, with six teeth on the front margin, and three besides the apical teeth on the hind margin; the second joint with three little teeth or serratures; the third joint twice as long as the second, with five teeth on the front margin; the fourth joint more elongate and slender than in the male, the largest tooth of the front margin being the seventh or eighth, below which are two strong teeth; the fifth joint relatively shorter than in the male.

Fourth Peræopods.—The fourth joint very much longer than the fifth, the front margin seemingly smooth, except for a minute setule here and there.

Fifth Peræopods.—Fourth joint much more than twice as long as the third and considerably longer than the fifth. In this and the preceding pair the gland-cells are very conspicuous in the long first joint.

Pleopods.—Peduncles narrowly oval.

Uropods.—Peduncles rather more slender and elongate than in the male; the second pair rudimentary, consisting of a single lanceolate joint so short that it only about reaches to the base of the telson.

Length rather greater than that of the male specimen.

Locality.—February 6–7, 1875; south of Mindanao, Celebes Sea; lat. 6° 20′ N., long. 123° 18′ E.; surface, night; surface temperature, 81°·7. Six specimens, one male, five female.

Remarks.—In one of the female specimens the third peræopods approach those of the male in the comparative shortness of the fourth joint, which has only seven teeth on the combined front and palmar margin; in this specimen one of the branchial vesicles of the fourth peræopods was normal, the other dwindled; small marsupial plates were developed to the first, second, and third peræopods, not overlapping as in the adult female but hanging down like small branchial vesicles; those of the second peræopods were the largest, these and the following pair being attached to the ventral surface of the animal a little in front of the branchial vesicles. Considerable as are the differences between the male and the females, there can be little or no doubt that these specimens all belong to the same species; they were taken together; they all have the same yellowish tone of colouring in spirits, and the intermediate character of the young females corroborates what is on other grounds probable.

It is possible that some of the specimens here described ought to be assigned to new species, but it seems so extremely uncertain whether the differences observed do not belong merely to age, sex, or individual peculiarity, that the distinguishing names originally chosen have been relinquished. Streets, in changing the name of his own *Anchylonyx hamatus* into *Phronimella elongata*, Claus, says that the second uropods are well developed in the male, and figures them with two rami. In no specimen, either from the Atlantic or the Pacific, have I been able to find biramous second uropods, and am therefore unable to say whether the solitary specimen of a male examined by Streets constitutes a separate species, *Phronimella hamata*, or is only one stage of development in the life-history of a species common to the whole circumference of the globe.

Phronimella elongata. Specimens C, D.

Male.—The seventh segment of the peræon and first three segments of the pleon deeper and less elongate than in the female, the fourth segment of the pleon also shorter; the first three segments of the pleon with the postero-lateral angles produced into a tooth, the hind margin a little higher up projecting not into a tooth but a rounded angle.

Upper Antennæ.—The peduncle short, with only two joints, the second shorter than the first; the flagellum eleven-jointed, the first joint large and of great length, the breast unarmed, apically a little produced but not reaching to the end of the joint, which is distally narrowed and carries a row of seven filaments commencing near but not on the distal part of the breast; the remaining ten joints are together shorter than the first and successively narrower, all longer than broad, but by no means linear, the last conical with a little setule at the tip.

Lower Antennæ.—The boss containing the antennary gland has an obtuse-angled

projection for the opening of the duct; of the three joints of the peduncle which follow, the first is the stoutest, the second the shortest, the third about equal in length to the first; the flagellum is nine-jointed, not linear, shorter than that of the upper antennæ, but in stoutness equal to its terminal portion, the first joint far the longest, longer than the peduncle, the other joints a little longer than broad.

Gnathopods.—These agree, certainly in all essential details, with those of specimen A. In the female I was able to perceive that the inner edge of the dactyloptera had a fine pectination, a character which may probably belong to all the specimens, though sometimes eluding observation.

First and *Second Peræopods* as in specimen A.

Third Peræopods.—First joint not greatly widened, with five teeth along the front margin, and two besides the apical teeth on the hind margin; the second joint only having the apical tooth of the front margin; the third joint with two teeth to the front margin; the fourth joint having in one limb the longest tooth the fourth, in the other limb the fifth on the front margin; the fifth joint scarcely so long compared with the fourth as in specimen A, so that the long tooth of the fourth joint would impinge below the middle of the upturned fifth joint.

Fourth and Fifth Peræopods.—The first joint with the front and hind margins almost parallel, much narrower than in specimen A.

Pleopods.—Peduncles long-oval; the cleft spine not so stout as in specimen A.

Uropods.—Second pair with only one ramus.

Length.—Three-tenths of an inch, exclusive of the antennæ.

Female.—In all parts much more elongate than the male.

Mandibles.—The trunk widest at the base, the cutting edge almost in line with the long narrow body of the trunk and almost as wide, its margin apparently smooth, though the surface just within it is closely striated as if leading up to a denticulate edge; the upper corner forms a shallow projection rather than a tooth, but the lower corner presents at least one sharp upturned denticle, to the rear of which the lower margin is ciliated; the left mandible has a secondary plate, about half the width of the principal plate, with its distal margin cut into about a dozen little teeth; the molar tubercle appears to be almost laminar, its broad distal margin partially projecting below the body of the mandible, set with numerous little sharp teeth and ciliated; the upper border of the trunk, of which no part is free, is nearly straight, without palp or process.

First Maxillæ.—The outer plate with some slender cilia and one or two that are more spine-like projecting from the inner margin; the oblique distal margin has four spine-teeth rather wide apart, followed by two that are larger and stouter near the outer apex and close beside these a smaller one at the apex; the one-jointed palp over-arches the outer plate, and has some very small spine-teeth on its distal margin.

First Peræopods.—The first joint has three small teeth on the lower part of the hind margin.

Second Peræopods.—The first joint has seven teeth along the hind margin, this joint being nearly as long as the three following together; the third joint is nearly as long as the fifth, while the fourth is noticeably longer than either.

Third Peræopods much longer than the second. Branchial vesicles little more than a fifth the length of the first joint. The first joint with twelve little unequal teeth along the front margin, and six or seven along the hind margin; the second joint with four or five very small teeth on the front, the third joint with six or seven; the fourth joint with the largest tooth the eleventh, below which the palm has three, the lowest blunt; the fifth joint though larger than in the male specimen, is little more than a third the length of the fourth joint, the large tooth of which touches its upturned inner margin a little below the centre.

Fourth Peræopods.—Branchial vesicles longer than the preceding pair, elongate, but less than half the length of the first joint. First joint elongate, much shorter than in the third peræopods, a little longer than the three following joints together, proximal part narrow, distal half widened, with the gland-cells conspicuous, the front margin forming a small apical tooth; the second joint considerably longer than broad, with a small apical tooth in front; the third joint a little more than twice as long as the second; the fourth about twice as long as the third; the fifth scarcely so long as the third.

Fifth Peræopods shorter than the fourth. First joint longer than in the preceding pair and a little more slender, much longer than all the remaining joints together, the second a little longer than broad, the third not more than twice as long as the second; the fourth more than twice as long as the second, less than twice as long as the fifth.

Pleopods.—Peduncles elongate, especially in the first pair.

Uropods more elongate than in the male specimen, except the second pair, which are reduced to a minute oval joint not long enough to reach the base of the telson; at the apex there is a hair or very small setule.

Telson very small, broader than deep, almost too flat-ended to be called semicircular, not reaching clear of the ventral opening.

Length.—The largest of the female specimens measured three-tenths of an inch from the front of the head to the end of the peræon, and four-tenths from the latter point to the extremity of the uropods, in all when fully extended seven-tenths of an inch.

Locality.—Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. Seven specimens; one male, six females.

Remarks.—Since in the male specimen the first joint in the flagellum of the upper antennæ, though greatly elongated, is without a brush of filaments, it is probable that the animal was not fully adult, and this will in part account for the great difference in size between this specimen and that of the largest female.

Phronimella elongata. Specimen E.

Locality.—August and September 1875; Pacific Ocean; lat. 7° 35′–5° 54′ N., long. 149° 49′–147° 2′ W.; surface; surface temperature, 81°. Three specimens, female.

Remarks.—The second uropods consist of a conical rudiment. One of the specimens presents an extraordinary spectacle, since it appears to be swarming in every part with a little oval parasite, unique in this respect among all the Challenger specimens of *Phronimella.*

Phronimella elongata. Specimen F.

Locality.—Station 268, August 30, 1875; between the Sandwich Islands and Tahiti; lat. 7° 35′ N., long. 149° 49′ W.; surface temperature, 81°. Two specimens, male.

Remarks.—The upper antennæ in one of these specimens are like those in the male specimen from Station 230, and nearly so in the other, but the narrow termination of the large first joint of the flagellum was ready to divide into smaller joints, and in the lower antennæ the long first joint was similarly ready for subdivision; the second uropods consisted only of a small single joint, about reaching to the base of the peduncles of the third pair.

Phronimella elongata. Specimen G.

Length, from the front of the head to the end of the peræon, five-twentieths of an inch; from the latter point to the extremity of the uropods, six-twentieths of an inch; the coalesced first and second segments of the peræon are shorter than any that follow; the seventh peræon segment is rather longer than the two preceding together; the first segment of the pleon the longest, a little longer than the last of the peræon, shallow, with the postero-lateral angle forming a tooth, above and a little beyond which the hind margin is roundly angled; the two following segments similar, successively shorter.

Locality.—Station 346, April 6, 1876; Tropical Atlantic; lat. 2° 42′ S., long. 14° 41′ W.; surface; surface temperature, 82°·7. One specimen, female.

Remarks.—In this specimen the sinuous upper outline of the heart could be perceived extending along the first two (coalesced) segments and the three following, in the last of these descending with a steep incline to its narrowed termination in the sixth segment; the three lateral openings could also be seen respectively in the compound segment and the two following. In the third peræopods the first joint is of great length, much longer than the first joint in any of the other pairs, longer than the three following joints together, the second joint has four teeth on the front margin, the third has six, the fourth has the ninth tooth longest with four little teeth to the palmar margin, the fifth joint is little more than a third as long as the fourth; in the fourth peræopods the first joint widens gradually from the base and is subequal in length to the three following joints together, the third joint is rather longer than the fifth, the fourth being much longer than either; in the fifth peræopods the first joint is rather longer than in the fourth, longer than the following joints together; the third is as long as the fifth, the fourth much longer than either, but all of these three much shorter than in the preceding pair; the peduncles of the pleopods like the branchiæ are slender, as usual the latter set being successively longer, the former set successively shorter; of the second uropods I cannot see the least trace.

The tenuity of this pellucid specimen might well suggest the specific name *filiformis*, which Bovallius has given to a specimen from the South Atlantic. Among the characters which he assigns to his species he mentions that the second peræopods are longer than the third, and that the second uropods are well developed; these characters, however, I believe to be not specific, but merely sexual, belonging to the male; the other characters which he assigns are, that the second gnathopods are much longer than the first, the processes at the apex of the hand longer than half the finger, and that the first joint is of the same length in the fourth and fifth peræopods; of the value of these relative measurements as specific characters it is very difficult to judge without drawings of the parts and without comparison of numerous specimens.

Phronimella elongata. Specimen H.

Locality.—Station 348, April 9, 1876; Atlantic, off the African coast; lat. 3° 10′ N., long. 14° 51′ W.; surface to 200 fathoms; surface temperature, 84°. Two specimens, female.

Remarks.—The larger of these was in close agreement with the specimen from Station 346, but the body a little more inflated, the colour yellowish, the third peræopods less elongate, having on the second joint three teeth, on the third five teeth, on the

fourth the largest tooth the seventh ; the difference in length between the first joint of the fourth peræopods and that of the fifth is scarcely perceptible ; the angle above the postero-lateral tooth in the first three segments of the pleon is very little rounded ; in the smaller specimen with the marsupial plates not fully developed, the third peræopod on one side of the animal had two teeth to the second joint, four to the third, and the large tooth of the fourth joint fourth in order, followed by four on the palmar margin ; the third peræopod on the other side had three teeth to the second joint, three to the third, and the large tooth of the fourth joint fifth in order, with the palm as in the other limb ; in the first three segments of the pleon the postero-lateral tooth had above it a very decided tooth instead of a more or less rounded angle of the upper margin ; no second uropods could be seen in either specimen.

Phronimella elongata. Specimen I.

Locality.—Station 108, August 27, 1873 ; off St. Paul's Rocks ; lat. 1° 10′ N., long. 28° 23′ W.; surface ; surface temperature, 78°. Eleven specimens, all female.

Remark.—No trace of second uropods could be seen in any one ; there were variations in the number of teeth on the joints of the third peræopods, and in the shape of the hind margin of the first three pleon-segments.

Phronimella elongata. Specimen J.

Locality.—Station 106, August 25, 1873 ; Mid Atlantic ; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms ; surface temperature, 78°·8. Thirty specimens, twenty-one females, nine males.

Remarks.—One of the male specimens in some respects, and especially as to the antennæ, agreed closely with that described from south of Mindanao ; the upper antennæ had fourteen joints remaining of the slender part of the flagellum, probably within one of the full number, since the last was very thin ; the upper antennæ were as long as the lower ; the third peræopods had two teeth on the third joint of one limb, and three teeth on that of the other ; the second uropods were reduced to a minute rudiment. Other specimens were similar, with variations as to the number of teeth ; in other specimens again, the male agreed as to antennæ and pleopods with the specimen from Station 230, but with the second uropods a mere rudiment, this being the case with all the male specimens, while the females agreed in having no trace of the second uropods.

The following table will show the range of the genus *Phronimella* as illustrated by the Challenger specimens :—

1. Station 3, February 18, 1873; south-west of Ferro, Canary Islands; lat. 25° 45′ N., long. 20° 14′ W.; surface; surface temperature, 65°. *Phronimella elongata*, ♀, Claus. One specimen, mounted during the voyage.

2. Station 348; lat. 3° 10′ N., long. 14° 51′ W. (See p. 1370.)

3. Station 346; lat. 2° 42′ N., long 14° 41′ W. (See p. 1369.)

4. Station 106, August 25, 1873; Mid Atlantic; lat. 1° 47′ N., long. 24° 26′ W. One specimen, female, mounted during the voyage. Thirty specimens (see p. 1371). Also one specimen, female, labelled "surface to 4 fathoms."

5. Station 108; lat. 1° 10′ N., long. 28° 23′ W. (See p. 1371.)

6. March 1–4, 1876; South Atlantic; lat. 36° 1′–36° 52′ S., long. 47° 35′–42°47′ W. One specimen, female, mounted during the voyage.

7. Western Pacific, north of New Guinea. Three specimens mounted in Canada balsam, and marked respectively "Phronimella ♀," "Phronimella ♀," "Phronimella ♂."

8. February 6–7, 1875; south of Mindanao, Celebes Sea; lat. 6° 20′ N., long. 123° 18′ E. (See p. 1362.)

9. January 9, 1875; China Sea, off Luzon; lat. 16° 35′ N., long. 117° 47′ E.; surface; surface temperature, 76°·5. Two specimens, female.

10. April 3, 1875; Pacific, between Papua and Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. One specimen, female.

11. Station 230; lat. 26° 29′ N., long. 137° 57′ E. (See p. 1366.)

12. March 1875; Pacific, Admiralty Islands to Japan. One specimen, female, mounted in Canada balsam.

13. Station 268, August 30, 1875; Sandwich Islands to Tahiti; lat 7° 35′ N., long. 149° 49′ W. (See p. 1369.)

14. August and September 1875; Pacific Ocean; surface. (See p. 1369.)

These stations show a range from lat. 26° 29′ N. to lat. 36° or 37° S., but as *Phronimella* is also recorded from the Mediterranean, its northward extension is carried some degrees higher; its extension from east to west as here exhibited confines it to the Atlantic and Pacific Oceans, but, as just observed, it is also found in the Mediterranean, and it has been recently reported by Dr. Giles from the Bay of Bengal.

Family Hyperidæ, Dana, 1852.

For Dana's account of the family, see Notes on Dana, 1852 (pp. 258, 261). For the definition by Claus, see Note on Claus, 1879 (p. 487).

Bovallius, who writes the name Hyperiidæ, thus defines the family in 1887:[1]—

"Head large, more or less globular. Eyes large, occupying the sides of the head.

[1] Arctic and Antarctic Hyperids, p. 559.

First pair of antennæ thick, scarcely tumid (♂ with multiarticulate flagellum). Second pair of antennæ almost similar to the first pair, not angulated, fixed at the anterior side of the head. Mandibles with palp. Seventh pair of pereiopoda not transformed [*Fifth Peræopods* normal]. Uropoda normal."

The genera included in the family by Bovallius[1] are *Hyperia*, *Iulopis*, *Hyperoche*, *Tauria*, *Hyperiella*, *Parathemisto*, *Euthemisto*, *Themistella*, and *Phronimopsis*. Of Dana's *Tauria*, however, Bovallius does not appear to have seen any examples, so that its validity as an independent genus remains more or less conjectural. *Phronimopsis* is withdrawn from the family Phronimidæ, in which Claus placed it, probably on account of the shortness of the head and the possession of a palp by the mandibles. *Cyllopus* and *Cystisoma*, which Claus alludes to as included among the Hyperidæ, are transferred to two separate families by Bovallius.

Genus *Phronimopsis*, Claus, 1878.

1878. *Phronimopsis*, Claus, Zool. Anzeiger, Jahrg. i. No. 12, p. 269.
1879. „ Claus, Der Organismus der Phronimiden, p. 5.
1881. „ E. von Martens,[2] Zool. Record for 1879, Crustacea, p. 33.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 424.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 489.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 23.

For the original definition of the genus, see Note on Claus, 1879 (p. 488). Bovallius in 1887 removed it, without giving any fresh definition, from the family Phronimidæ, in which it was placed by Claus, and made it the ninth genus of the family Hyperiidæ. As the genus now includes three species, the definition may be modified as follows:—

Antennæ of both pairs having multiarticulate flagella in the male, but not in the female.

Mandibles with dentate cutting edge, a secondary plate on the left mandible, a molar tubercle, and, in the male, a three-jointed palp.

The *First Gnathopods* simple, with hairy finger; the *Second Gnathopods* chelate.

The *Peræopods* slender, all narrowly subchelate.

Uropods with long narrow peduncles and narrowly lanceolate rami.

Telson small.

The *Head* short and deep; branchial vesicles attached to the second, third, and fourth pairs of peræopods.

There are in the heart of *Phronimopsis spinifer*, Claus says, three pairs of venous ostia.

[1] Systematical List of the Amphipoda Hyperiidea.
[2] The index suggests the form *Phronimatopsis*.

Phronimopsis tenella, n. sp. (Pl. CLXIV.).

Head deeper than long, deeper than the peræon; first two segments of the peræon partially coalesced, deeper than the two following, and those two deeper than the three that succeed them; the first three segments of the pleon much longer and deeper than the peræon-segments, the postero-lateral angles rounded, though there is a minute point showing where the convex lower margin and convex part of the hinder margin meet. The skin apparently without pigment-flakes.

Eyes probably having an upper and lower group of ocelli, but in our specimen they were scarcely visible except near the lower margins of the head.

Upper Antennæ.—Peduncle short, tumid, the first joint a little longer than broad, the two following much shorter than their breadth; the first joint of the flagellum about as long as the peduncle, narrowing to the distal end, its broad breast lined with a brush of long filaments, the breast not quite reaching the apex of the joint; the second joint rather longer than broad, the third joint narrower but considerably longer than the second. The remainder missing. The second joint of the flagellum, besides having apical filaments, has a narrow decurrent process, the blunt apex of which is tipped with long filaments.

Lower Antennæ.—Gland-cone broad, projecting from the wall of the head; the third (first free) joint cylindrical, as broad as long; the fourth joint scarcely so large as the third, widened distally; the fifth joint not quite so long as the third and fourth together, distally a little narrowed and produced over the slightly bulbous base of the first joint of the flagellum, this joint being slender, longer than the fifth joint of the peduncle; the remainder missing.

Upper Lip.—I believe it is correct to say that this is unsymmetrically bilobed.

Mandibles.—Cutting plate divided into six or seven teeth forming a convex edge; the right mandible (fig. *m.*) without a secondary plate, the left mandible having a secondary plate similar to the primary, about equally long; the teeth were not counted as this plate was seen only in profile; the lower edge of the trunk and the upper part of its surface to the rear of the cutting plate are strongly ciliated; to the rear of the ciliated portion is a broad molar tubercle, the crown of which has a sharp, slightly crenate edge; the three-jointed palp is much longer than the trunk, slender, the first joint the thickest, equal in length to the slightly curved third, the second longer than either.

Lower Lip.—The forward margins finely ciliated. The mandibular processes with rounded apices.

First Maxillæ.—Inner plate not strongly developed; outer plate having much of its surface crowded with hair-like setules or spinules, from among which distally a series or group of about seven strong spines emerge; one of the seven appears to be apically

toothed; the palp reaching beyond the outer plate, widening distally, the broad apex set with minute spine-teeth and having a larger spine near the inner angle.

Second Maxillæ.—The inner plate considerably shorter than the outer, with one spine at the apex, the outer plate with two spines at the apex and one on the inner margin below the apex, each of these spines having a lateral tooth; both plates have numerous hair-like setules.

Maxillipeds.—The inner plate large, three-sided, the inner surface constituted by two of the sides which are covered with hair-like setules, the narrow apex carrying two or three spines; the outer plates long and narrow, very finely ciliated, with a small spine at the acute apex, a setule in a notch a little below it on the outer margin, another in a notch rather lower on the inner margin, and a third lower than this on the outer margin; the first joint or chin is short, while the following joint is long, longer than the outer plates.

First Gnathopods.—The side-plates in this species are not jointed. First joint of the limb a little sinuous, not very elongate, wider below than above, smooth-edged, adapted for gland-cells, as seems to be the case in all the six following pairs of limbs; second joint not longer than broad; third joint rather longer, with a spine at the apex of the hind margin and a larger one in the middle of the minutely pectinate distal margin; the wrist a little shorter than the hand, wider above than below, the front margin convex, smooth, the hinder with a spine standing out above the middle, where the joint begins to narrow; the hand not very much shorter than the first joint, narrow, and narrowing distally, the front margin smooth, the hinder ciliated and having a serrature of four points wide apart; the finger curved, not half the length of the hand, armed all along with two or more rows of long, closely set cilia; the nail short.

Second Gnathopods.—First and second joints as in the preceding pair, but larger; third joint longer than the second, without spines; the wrist distally cup-like, not so wide as the hand, much wider than the third joint, but not longer, apart from the long, tapering, partially channelled process into which its hinder margin is produced; the apex of the process, which appears to be a little pectinate, carries an acute spine; the massive hand, of which the basal part is much longer than broad, and much longer than the process of the wrist, has its hind part prolonged into a broad, somewhat tapering, blunt-ended thumb; the triangular tapering finger applies closely against the irregular front or inner margin of the thumb, forming a complete chela; the blunt (perhaps worn) apex of the finger in our specimen does not quite reach the apex of the thumb; the front margin of the finger is rather concave than convex.

First Peræopods.—The first joint similar to that in the gnathopods, but more elongated, as long as the third and fourth joints together; the second joint longer than broad; the third much longer than the second, widening distally, the hind margin minutely pectinate, carrying three spines at intervals, the lowest the largest; the

fourth joint much longer than the third, carrying four spines along the hind margin, which with its rounded apex is minutely pectinate; the fifth joint slender, slightly curved, a little longer than the fourth, with cilia and spinules along the hind margin, which is produced into a tooth facing the base of the finger, this tooth being a little irregularly denticulate on the inner or front margin; the finger long and slender, curved, more than half the length of the fifth joint, the distal part except at the tip minutely furred.

Second Peræopods.—Branchial vesicles oval, smooth, not so long as the first joint (whether occurring with the first peræopods I am uncertain). The limb like that of the preceding pair, perhaps a little longer.

Third Peræopods longer than the second, and without strong marginal spines, the branchial vesicles of this and the following pair similar. The first joint of the limb elongate, distally a little widened, its front margin distally finely ciliated and produced at the apex into a thin spine-like tooth overlapping part of the second joint; the second joint with the hind margin ciliated and apically produced into a similar but shorter tooth; the third joint longer than in the preceding pairs, its hind margin ciliated and carrying two or three small spinules, apically produced into a short tooth; the fourth joint nearly as long as the first, nearly three times as long as the third, similarly armed, the apex not produced; the fifth joint shorter than the fourth, much longer than in the preceding pair, but similarly produced at the apex, the inner or hinder margin of the tooth having several denticles, besides which there is a little thin laminar process with finely pectinate edge; the finger is thin and curved, bulbous at the base, similar to that in the preceding peræopods but much shorter.

Fourth Peræopods similar to the preceding, but with the third joint a little longer, the fourth and fifth joints shorter, the fourth joint considerably shorter than the first, and the fifth than the fourth.

Fifth Peræopods similar to the fourth, except in the relative lengths of the joints, those of the fourth and fifth being here reversed, the fourth being much shorter than the fifth.

Pleopods.—The peduncles longer than the rami, as usual shorter in the third pair than in the two preceding pairs; the coupling spines have four retroverted teeth on one margin and two on the other, besides the apical teeth; the cleft spine has the two arms almost of equal length, that with the expansion near the apex not the shorter; the joints of each ramus are six in number.

Uropods.—The peduncles and rami have the edges finely but closely ciliated; they are all rather narrow and elongate, those of the first pair the longest, the peduncles reaching beyond those of the second but not so far as those of the first; the narrowly lanceolate rami of the first pair are subequal, a little longer than the other pairs, and like them more than half the length of their peduncles, the adjacent edges faintly emarginate

and thickly ciliated near the base; in the second pair the outer ramus is slightly the shorter; in the third pair the peduncles are rather longer, the inner ramus not shorter but rather narrower, than in the second pair; the outer ramus is broken.

Telson very small, not longer than broad, apically narrowed, the apex rounded, with a thin edge.

Length about three-tenths of an inch, measuring from the front of the head to the back of the second pleon-segment and thence to the extremity of the uropods.

Locality.—The specimen was labelled "July 1875, lat. 35° N., Japan to Honolulu, surface." One specimen.

Remarks.—The specific name refers to the delicacy of the general texture and structure of the animal, which is in contrast with the strong chelæ of the second gnathopods and tenacious looking claws of the peræopods. From the Mediterranean species to which Claus gives the name of *Phronimopsis spinifer* at page 6 of Der Organismus der Phronimiden, but the name of "*Phronimopsis Zoea*" at page 82 in the explanation of the plates, the present species is distinguished by the absence of the spine-process on the peduncle of the upper antennæ which Claus finds in both sexes of his species; it is also very different from the type-species in the shape of the peræon and the relative size of the pleon, as well as in the absence of pigment-markings, while in many other respects it shows a remarkable resemblance to its European congener; from *Phronimopsis sarsi*, Bovallius, inhabiting "tropical parts of the Atlantic," it is distinguished, in having a peræon which can scarcely be described as "normal," in having the first segment of the peræon partially coalesced with the second, and in having the telson rather triangular than semicircular, a fourth of the length of the peduncles of the third uropods, instead of "shorter than a sixth."

Genus *Hyperia*, Latreille, 1823.

1823. *Hyperia*, Desmarest (from Latreille), Dict. d. Sci. Nat., Art. Malacostracés, t. 28.
1825. „ Desmarest (from Latreille), Consid. gén. sur la classe des Crustacés, p. 258.
1825. *Hypérie*, Latreille, Fam. nat. du Règne Animal, p. 289.
1825. *Hyperia*, Guérin, Encycl. Méth., Art. Uroptère, t. x.
1829. „ Latreille, Le Règne Animal, t. iv. p. 117.
1829. *Hiella*, Straus-Durckheim, Mém. du Mus. d'Hist. Nat., t. xviii.
1830. *Hyperia*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 387 (extr., pp. 34, 36).
1830. *Lestrigonus*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 392 (extr., pp. 34, 41).
1831. *Hyperia*, Latreille, Cours d'Entomologie, p. 400.
1836. „ Guérin-Méneville, Iconographie du Règne Animal, t. ii., iii., pl. xxv. figs. 5, 6.
1837. „ Burmeister, Handbuch der Naturgeschichte.
1837. *Lestrigonus*, Burmeister, Handbuch der Naturgeschichte.
1838. *Hyperia*, Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.

1838. *Lestrigon*, Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.
1838. *Lestrigonus*, Krøyer, Grønlands Amfipoder, p. 296.
1840. *Hyperia*, Milne-Edwards, Hist. nat. des Crust., t. iii. p. 74.
1840. *Lestrigonus*, Milne-Edwards, Hist. nat. des Crust., t. iii. p. 81.
1840. *Hyperia*, Lucas, Hist. nat. des Crust. Arachn. et Myriap., p. 233.
1840. *Lestrigon*, Lucas, Hist. nat. des Crust. Arachn. et Myriap., p. 235.
1841. *Hyperia*, Gould, Invertebrata of Massachusetts.
1849. „ Nicolet, Hist. fis. y pol. de Chile por Claudio Gay, Zool., t. iii.
1852. *Lestrigonus*, Dana, Amer. Journ. Sci. and Arts., ser. 2, vol. xiv. No. 41.
1852. *Hyperia*, Dana, Amer. Journ. Sci. and Arts., ser. 2, vol. xiv. No. 41.
1852. *Lestrigonus*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 980, 981, 1442.
1852. *Hyperia*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 980, 986, 1442.
1852. „ Liljeborg, Hafs-Crustaceer vid Kullaberg.
1855. „ Gosse, Manual of Marine Zoology.
1857. „ White, Popular History of the British Crustacea, p. 205.
1859. „ Kinahan, Nat. Hist. Review, vol. vi.
1859. *Lestrigonus*,[1] Kinahan, Nat. Hist. Review, vol. vi.
1860. *Hyperia*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 636.
1860. *Lestrigonus*, Boeck, Forh. ved de Skand. Naturf. 8de Møde, p. 636.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 287.
1862. *Hyperia*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 292.
1863. *Lestrigonus*, Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 3.
1863. *Hyperia*, Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 10.
1864. „ Fritz Müller, Für Darwin (trans., p. 76).
1865. *Lestrigonus*, Costa, Rend. dell' Accad. delle sci. fis. e mat., Anno iv. Napoli., p. 34.
1865. *Hyperia*, Goës, Crust. amph. maris Spetsb., p. 18.
1868. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 521.
1868. „ Thomas Edward, Stray Notes, Journ. Linn. Soc. Lond. (Zool.), vol. ix. pp. 143, 165.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, p. 286.
1870. „ Boeck, Crust. amph. bor. et arct., p. 5 (85).
1872. „ Boeck, De Skand. og Arkt. Amph., p. 78.
1873. „ Metzger, Physik. und faunist. Untersuch. in der Nordsee, 1871.
1874. „ Verrill and Smith, Invert. Anim. of Vineyard Sound, pp. 273 (567), &c.
1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 91.
1877. *Lestrigonus*, Streets, Bulletin U.S. Nat. Mus., No. 7, p. 125.
1878. *Hyperia*, Claus, Zool. Anzeiger, Jahrg. i. p. 269.
1878. „ Gegenbaur, Grundriss der vergleichenden Anatomie, 2te Aufl. Bell's Trans.
1879. „ Claus, Der Organismus der Phronimiden, p. 2.
1879. „ Thomas Edward, Selections from Fauna of Banffshire, in Life by Smiles, App., p. 435.
1879. „ Grenacher, Untersuch. über das Sehorgan der Arthropoden.
1884. „ Blanc, Die Amph. der Kieler Bucht, p. 51.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 422.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 491.
1887. „ Bonnier, Catal. des Crust. Malac. Concarneau, p. 67.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 16.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 559.
1887. „ Chevreux, Catal. Crust. Amph. Bretagne, p. 4.

[1] Kinahan was here the first to suggest that *Hyperia* and *Lestrigonus* might represent the sexes of a single genus.

1887. *Lestrigonus*, Giles, On Six New Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. No. 2, p. 224.
1887. *Hyperia*, Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 56.
1888. ,, Robertson, Catal. Amph. and Isop. of Clyde, p. 64.

For the original definition of the genus see Note on Desmarest, 1825 (p. 122). For the definition of *Hiella*, see Note on Straus-Durckheim, 1829 (p. 139); for that of *Lestrigonus*, see Note on Milne-Edwards, 1830 (p. 142). Bovallius in 1887 defines *Hyperia* as follows :-

"Head large, nearly globular, flattened anteriorly. Pereion smooth, in the females larger and more tumid than in the males. Carpus of first pair of pereiopoda [wrist of *First Gnathopods*] dilated, less produced than in second pair, the produced carpal process in both pairs spoon-shaped. Carpi of third and fourth pair [fourth joint of the *First* and *Second Peræopods*] not dilated. Last three pairs subequal, not or only a little longer than the two preceding pairs. Epimerals distinct. Uropoda short and broad. Telson very large."

Hyperia sibaginis, n. sp. (Pl. CLXV.).

First and seventh segments of the peræon dorsally the longest; the first three segments of the pleon much longer than any of the peræon-segments, the postero-lateral angles almost right angles, the produced points being minute in the first and second segments, and the third having none.

Upper Antennæ.—The peduncle short, the first joint tumid, not longer than broad, the two following joints very short; the first joint of the flagellum somewhat bent upwards, narrower than the peduncle, but longer, its lower margin longer than the upper, clothed with a brush of filaments, of which the longest are near the base; the remainder of the flagellum is linear, fringed with setules, of twenty-three joints, of which the first and second are the shortest, rather stouter than the rest.

Lower Antennæ.—The third (first free) joint of the peduncle not longer than broad, second rather shorter, third longer, bent a little upward, the proximal part wider than the distal; the flagellum linear, much longer than that of the upper antennæ, fringed in a similar manner, of about thirty joints, which are rather longer than those of the upper antennæ, the first not short, bulbous at its base.

Upper Lip unequally bilobed, the apical cleft rather deep.

Mandibles almost rectangular, with the palp fixed at the upper front angle, the small cutting plate projecting at the angle below, while the lower angle to the rear is rounded; the cutting edge divided into nine denticles, the rather narrower secondary plate of the left mandible having an edge of ten or a dozen denticles; behind these plates is a group of spinules on the lower margin, immediately to the rear of which projects the

multidenticulate crown of the broad molar tubercle, with about five and twenty teeth in each row; on the left mandible there came into view a laminar edge which was finely pectinate rather than dentate; on the right mandible a row of fourteen projecting setules was observed; these minute details depend so much, as far as observation is concerned, on the position of the mandible when mounted, that they cannot easily be made of any service for specific characters; the first two joints of the palp together longer than the trunk, the first the thickest, about three-quarters the length of the second, the second a little shorter than the third, which is slightly curved, apically acute, smooth except for the adpressed cilia of the surface.

First Maxillæ.—Basal joint broad, length and breadth about equal, the following joint longer but less broad; the outer plate more or less triangular, furred with setules or spinules, and distally carrying a group of strong spines; the palp broader and much longer than the outer plate, with spinules along the inner border, two little spines at its apex, and the apical border having a sort of mixed pectination and denticulation.

Second Maxillæ.—The inner plate shorter than the outer, each apically narrowed and beset with spinules and setules.

Maxillipeds.—The first joint or chin short, the following joint long and narrow, longitudinally ridged on the inner surface, the ridge apparently ending in an apical tubercle surmounted by a spine which does not rise above the outer rounded distal margin of the joint; the two outer plates have their bases close together within the distal margin; they are narrow, with four little spine-teeth on the serrate inner margin, one such at the apex, and one just below it on the outer margin.

First Gnathopods.—Shape of side-plates not discerned. First joint narrowly flask-shaped, considerably longer than all the remainder of the limb; second joint with a spine at the hinder apex; third joint very little longer than the second, with a longer apical spine, the distal margin projecting a little behind the wrist; the wrist distally much wider than the hand, with a spine at the apex of the convex front margin, the straight hind margin having one spine near the apex and two at the apex, which is produced so as to clasp the base of the hand and is pectinate on its inner edge; the hand a little shorter than the produced wrist, having much of the nearly straight hind margin pectinate, the front margin carrying on the distal half two spines and an apical spinule; the finger curved, not half the length of the hand, finely pectinate on the inner edge.

Second Gnathopods.—The first joint rather longer than in the first gnathopods and its front straighter, the remaining joints very similar to those of the preceding pair, but all rather larger, the wrist more strongly produced and more decidedly longer than the hand.

First Peræopods.—The side-plates as in the other segments small and with the upper boundary very faintly marked. The branchial vesicles large. The first joint rather larger than in the second gnathopods, longer than the three following joints together,

widening almost at once from the narrow neck, carrying a spinule at the apex of the hind margin; the short second joint with its hind margin longer than the front; the third joint much shorter than the fourth, widening distally, the hind margin smooth except for a cilium at the centre and a small spine near the apex; the fourth joint not quite so long as the fifth, the front margin convex, smooth, the hind margin straight, fringed with little thin spinules, and having one spine near the apex; the fifth joint narrower, slightly curved, the little spinules fringing the hind margin being here more decurrent; the finger more than half the length of the fifth joint, slender, curved, a little bulbous at the base, both margins smooth, or with a little submarginal pectination near the base of the inner edge.

Second Peræopods very similar to the first, but with the first joint and the last three joints rather longer, the fourth and fifth equal in length, the armature as in the other pair.

Third Peræopods.—First joint a little expanded but not very widely, wider below than above, scarcely longer than the third and fourth joints together, the hind margin smooth, the front at first smooth, then serrate, more strongly and closely so as it approaches the apex; the second joint short, with a spinule at the front apex; the third joint longer than in the preceding peræopods, with a few spinules along the front margin; the fourth joint much longer than the third, the front margin fringed with little spinules, there being here as elsewhere a longer spinule or setule at intervals, planted within the margin; the fifth joint longer than the fourth, armed in like manner; the finger very slender, apically curved, not half the length of the fifth joint, the front margin below the bulb being pectinate for nearly a third of the finger's length.

Fourth Peræopods rather larger and longer than the third; the first joint having on one limb four, on the other limb five, spines at intervals along the middle of the front margin, which is serrate below; the other joints are armed as in the preceding pair; the fifth joint in particular has a greater length.

Fifth Peræopods shorter than the third, armed like the fourth. The first joint broader above than below, broader than in either of the preceding pairs; the fourth joint shorter than the third, very much shorter than in the preceding pairs; the finger half the length of the fifth joint, pectinate along nearly half of its inner margin.

Pleopods.—The peduncles stout; the coupling spines small, with acute apex and four teeth on each margin; the first joint of the inner ramus not very long, narrow at the base, and widened below, its inner margin ciliated, the cleft spine with slender not very unequal arms; the first joint of the outer ramus carrying four or five plumose setæ on the outer margin and having an interlocking process on its surface; the joints of each ramus eight in number, the joints not elongate, the accompanying pairs of setæ rather stout.

Uropods.—Peduncles of the first pair longer than the rami, the outer margin

apically acute, the distal margin being in this and the other pairs pectinate on the under surface; the outer ramus a little shorter and broader than the inner, its outer margin having three pronounced teeth, the inner edge having a ciliated and pectinate emargination a little way below the base, the rest of the edge being microscopically pectinate almost down to the acute apex; the inner ramus has its inner margin smooth, and the outer margin strongly pectinate, a ciliated emargination near the base facing that of the other ramus; the peduncles of the second pair are scarcely longer than the rami, which are as large as in the first pair, the outer ramus with four teeth on its outer margin, the inner edge finely pectinate, with a slight unciliated emargination near the base, the inner ramus with the upper part of the outer edge faintly emarginate with a definite pectination, which becomes almost imperceptible on the lower part; the peduncles of the third pair longer and broader than those of the first, the rami also similar to those of the first pair, but much shorter, with two teeth only on the outer margin of the outer ramus, and the inner ramus rather broader than the outer.

Telson.—The length scarcely equal to the breadth, forming three-quarters of a circle, about a third of the length of the peduncles of the last uropods.

Length, in the position figured, and in a straight line from the front of the head to the extremity of the uropods, less than a fifth of an inch.

Locality.—Station 200, October 23, 1874; off Sibago, Philippines; lat. 6° 47′ N., long. 122° 28′ E.; daytime, 80 fathoms; surface temperature, 85°·5. The specimen described, a male.

Hyperia luzoni, n. sp. (Pl. CLXVI., A.).

Head deeper than long; first two segments of the peræon dorsally coalesced; the first three segments of the pleon almost squared at the postero-lateral angles.

Upper Antennæ.—The first joint of the peduncle longer than broad, the second joint very short, and the third still shorter; the first joint of the flagellum tapering, nearly as long as the peduncle, showing in the interior the preparation for the yet undeveloped brush, at the apex carrying a few filaments; the remaining joints twenty-five in number, not linear.

Lower Antennæ rather shorter than the upper. The third (first free) joint of the peduncle longer than the fourth and shorter than the fifth; the flagellum of twenty-four short joints, the first the longest, showing preparation within for subdivision into three joints.

Mandibles with rather elongate trunk, the teeth of the molar tubercle not very much crowded together, the first joint of the palp elongate, shorter than the second, which curves outwards forming an angle with the first, while the scarcely longer, acutely tipped third joint is directed inwards so as to form another angle with the second.

Lower Lip.—The principal lobes narrow, finely ciliated; the mandibular processes also narrow.

First Maxillæ.—The outer plate of the usual triangular form, strongly ciliated, and with the usual seven or eight strong spines at the distal end; the palp broad, only a little longer than broad, with four little unequal teeth at the apex of the inner margin, the distal margin finely pectinate.

Second Maxillæ.—The plates as usual strongly ciliated, and tipped with one or two spines.

Maxillipeds.—The second joint elongate; the outer plates short, broad at the base, the inner margin carrying four spinules, of which there are two at or near the rounded apex.

First Gnathopods.—Side-plates small. The first joint not so long as the remainder of the limb, broader above than below, the front margin being very sinuous; the second joint not longer than broad; the third very little longer than the second, the hind margin scarcely projecting beyond the wrist, with one spine at the apex; the wrist wider but not longer than the hand, the front margin smooth, the hinder carrying three spines, and the apex, which projects very little beyond the hand, having two more which are smaller; the hand distally narrowed, with one spine on the convex front margin, and three little spinules on the straight faintly pectinate hind margin; the finger slender, bulbous at the base, very slightly curved, more than half the length of the hand.

Second Gnathopods longer than the first. The first joint slender, bent, scarcely broader above than below; the third joint longer than the second, with two spines at the scarcely projecting hinder apex; the wrist a little longer than the hand, its straight and smooth hind margin being a little produced, the produced apex and distal margin carrying five spines; the slender hand has two spines on the convex front margin, the straight hind margin smooth; the finger more than half the length of the hand.

First Peræopods.—The first joint with the narrow neck bent, the rest of the joint long and straight, not broad, with smooth margins; the second joint a little longer than broad; the third not shorter than the fourth, with one spinule near the apex of the hind margin; the fourth joint with a spinule near the middle and a spine near the apex of the hind margin; the fifth joint a little curved, longer than the fourth, the hind margin very faintly pectinate; the finger a little bulbous and bent at the base, then straight, with a setule on the inner margin, lying along the apex.

Second Peræopods very similar to the first, but longer; the fourth joint longer than the third, each with two spines on the hind margin; the fifth joint considerably longer than the fourth, with two little setules besides the microscopic pectination of the hind margin; the finger about half the length of the fifth joint, with no apical setule as far as could be perceived. (On one side of the animal the first peræopod was almost exactly like the second.)

Third Peræopods.—The first joint oval, with smooth edges; the second joint short; the third rather longer than the fourth; the fifth longer than the third; each of these four with one or two minute spinules on the front margin; the finger slender, curved, acute, a little more than half the length of the fifth joint.

Fourth Peræopods.—The first joint narrower than in the preceding pair, with one spine not far from the apex of the front margin.

Fifth Peræopods like the two preceding pairs, but having the fourth and fifth joints shorter; the first joint is rather wider than in the preceding pair.

Pleopods more slender than in *Hyperia sibaginis*, the rami with seven joints, in other respects very similar.

Uropods.—The peduncles of the first pair longer than the rami, reaching almost equally far back with the peduncles of the third pair; the outer ramus a little shorter than the inner, pectinate on the inner margin, the inner ramus pectinate on the outer margin, both rami narrowly lanceolate; peduncles of the second pair shorter than the inner ramus, scarcely longer than the outer; peduncles of the third pair set wide apart, a little longer than the rami; the rami about equal, not reaching so far back as the rami of the first pair, which they in general resemble.

Telson forming an oval truncate at the base, about three-quarters of the length of the peduncles of the third uropods.

Length, three-twentieths of an inch, exclusive of the antennæ.

Localities.—January 9, 1875; China Sea, off Luzon; lat. 16° 35′ N., long. 117° 47′ E.; surface; surface temperature, 76°·5. One specimen, young male.

January 1875; Zebu Harbour, Philippines; surface. Two specimens from this locality appear also to belong to this species.

Hyperia luzoni, young (?).

Head deeper than long; first two segments of the peræon dorsally coalesced; postero-lateral angles of the first, second, and third segments of the pleon squared or a little acute.

Upper Antennæ two-jointed, placed rather high up and reaching about down to the lowest point of the deep head, the first joint a little longer than broad, the second between two and three times as long as the first, tapering, with one or two long filaments at about the middle of the inner margin, and a row of cilia near the outer margin at its lower half.

Lower Antennæ much shorter than the upper, with a short basal joint, and a longer slightly tapering one, on the blunt end of which there is a cilium.

Mandibles without palp.

Maxillipeds.—The shaft narrow, shaped like a dice-box, the inner plate small,

ciliated, the outer plates short and broad, their inner edges for more than half the length closely conjoined, scarcely or not at all overlapping, then diverging so as to form a wide shallow cup, with its cavity furred.

First Gnathopods.—First joint much bulged near the base on the outer margin; the hand with two spines on the hind margin of the wrist, none on the front margin of the hand.

Second Gnathopods.—There is a single spine on the front margin of the hand.

In the *Peræopods* and general details this form closely resembles the larger form from the other side of the Pacific.

Pleopods with six joints on the outer and five on the inner ramus.

Uropods.—Peduncles of the first pair equal in length to the inner ramus, reaching a point intermediate between the ends of the peduncles of the second and third pairs; the inner ramus reaching a little beyond the outer, not quite so far as the outer ramus of the third pair; peduncles of the second pair intermediate in length between the longer inner and shorter outer ramus; peduncles of the third pair longer than the outer ramus, the inner ramus broken, probably longer than the outer.

Telson somewhat triangular but with the apex rounded, on a level with the end of the peduncles of the first uropods.

Length, a little over one-tenth of an inch.

Locality.—Station 296, November 9, 1875; South Pacific; lat. 38° 6′ S., long. 88° 2′ W.; surface; surface temperature, 59°·8. One specimen.

Hyperia promontorii, n. sp. (Pl. CLXVI., B.).

The coalesced first and second and the seventh segments of the peræon the longest, each of the first three segments of the pleon much longer than any of the peræon-segments, their postero-lateral angles rounded; the body and limbs dotted with a few colour-spots.

Upper Antennæ.—First joint of peduncle longer than broad, the two following joints together more than half the length of the first joint; the first joint of the flagellum as long as the peduncle, with a thick brush of filaments on the breast, and two or three separate groups of filaments on the narrowed apical part, one group of two being on the tubercular projection of the apex; the second joint little longer than its distal breadth, its upper margin like that of the first joint straight, its lower margin oblique, produced, distally forming two or three tubercular projections each with one or two filaments; the remaining joints, which are more than twelve in number, are elongate, linear, with cilia or minute setules here and there; the slightly produced tubercular apices of the first two joints are the characteristic feature.

Lower Antennæ.—Opening of the gland-cone tolerably conspicuous; third (first free)

joint of the peduncle broader and a little longer than the fourth, fifth joint longer than the third; flagellum linear, of more than thirteen elongate joints, of which the first is a little bulbous at the base.

Epistome domed, broader than deep, on one side projecting unsymmetrically.

Upper Lip deeper than the epistome, unsymmetrically bilobed by an oblique apical emargination.

Mandibles and *Maxillæ* nearly as in *Hyperia sibaginis;* the palp of the first maxillæ longer in proportion to its breadth.

Maxillipeds.—The outer plates rather large, with four little spinules along the inner margin and two at the apex.

First Gnathopods.—The upper boundary of the side-plates could not be clearly distinguished in any part of the peræon, though here and there faint indications of it seemed to exist. The first joint as long as the following four together, most dilated at the middle, the front margin being a little bowed out at that part, gland-cells visible in the first joint as well in both gnathopods as in the peræopods; the second joint not longer than broad; the third joint longer than the second, forming a kind of pentagon with three spines on the distal border which projects behind the wrist, the apex adjoining the wrist being finely pectinate; the wrist much broader but not longer than the hand, with a spine at the apex of the convex front margin, two spines on the straight hind margin, one at its produced apex, and four of less size within that apex; the hand with two spines on the convex front margin at the narrowed distal part, the hind margin nearly straight, pectinate except near the base, the narrow apical margin finely pectinate; the finger slender, curved, more than half the length of the hand, its inner margin microscopically pectinate.

Second Gnathopods longer than the first; the first joint a little widened distally instead of at the centre, the wrist produced to the middle of the hand and exceeding it in length, the hand with a small and a large spine on the hind margin, the spines here as in the first gnathopods being minutely plumose. The first and second gnathopods are, as usual in this and some other genera, situated very close together, and are so arranged that until they are separated it is not possible to obtain a lateral view of the lower joints of both.

First Peræopods.—Branchial vesicles of ample size, a description which applies to all the five pairs. The first joint narrow at the neck and slightly bent, then widened, exceeding in width as well as in length the first joint of the gnathopods; the second joint longer than broad; the third joint shorter than the fourth, with the hind margin straight, carrying a small apical spine, the front margin very convex; the fourth joint a good deal shorter and wider than the fifth, the hind margin pectinate but not closely, carrying a spine at the apex and one higher up, the front margin convex; the distal margin finely pectinate, projecting behind the fifth joint; the fifth joint slender, curved,

with the hind margin closely pectinate; the finger slender, curved, about half the length of the fifth joint, the bulb at the base squared, the inner margin faintly pectinate for a short distance below this.

Second Peræopods closely resembling the first, the fifth joint rather shorter.

Third Peræopods.—The first joint scarcely longer than that of the preceding pair, but broader, oval, narrowest above, the margins smooth, except for two minute spinules on the upper part of the front, and a setule at its apex; the four following joints longer than in the preceding pair, the second rather broader, the third, fourth, and fifth, rather narrower; the fourth and fifth pectinate along the front margin and having a small inward-curving spine at the apex; the finger about a third of the length of the fifth joint, its shape and armature as in the preceding pair.

Fourth Peræopods differing little from the third, except that all the joints are a little longer and, except the first, a little broader; the first is rather narrower and has three little spines disposed along the front margin.

Fifth Peræopods slightly shorter than the third; the first joint narrowed above, with two small spines on the lower half of the front margin; the four following joints rather stouter than in the third peræopods, the fourth and fifth rather shorter.

Pleopods not differing very materially from those described for *Hyperia sibaginis*.

Uropods.—Peduncles of the first pair the longest, reaching back to a point midway between the ends of the peduncles of the second and third pairs, longer than the rami, the distal margin pectinate; the outer ramus shorter than the inner, the outer margin of the outer and the inner margin of the inner not toothed, the other two edges having the ciliated emargination as described for *Hyperia sibaginis*, the remainder of the border being pectinate with little teeth almost to the acute tip; second pair like the first, but with the peduncle considerably, and the rami a little, shorter; third pair with the peduncles shorter than those of the first, and longer than those of the second pair, the rami similar to those of the other pairs but shorter.

Telson scarcely if at all longer than broad, forming an inverted arch, the apex nearly acute; the length less than one-half, more than a third, of that of the peduncles of the third uropods.

Length, without the antennæ, a fifth of an inch.

Locality.—Station 141, December 17, 1873; off the Cape of Good Hope; lat. 34° 41′ S., long. 18° 36′ E.; surface; surface temperature, 66°·5. Several specimens, that described and figured being a male.

Remark.—The specific name refers to the capture of the species in the neighbourhood of the Cape of Good Hope.

Hyperia dysschistus, n. sp. (Pl. CLXVII.).

In this compact little species, the sixth and seventh segments of the peræon are distinct, but the first five segments, though more or less faintly marked, do not appear to be separated except in the vicinity of the side-plates; the body is large as compared with the limbs; postero-lateral angles of the first three pleon-segments squared.

Upper Antennæ.—In the male (no doubt not adult) specimen, the peduncle consists of one joint broader than long, the flagellum of one thick joint, twice as long as the peduncle, at first tapering rapidly, and at the end of the tapering portion carrying six or eight filaments, the apical part of the joint not slender or tapering, with an indication at the rounded end of a minute second joint. In the female these antennæ were much more slender, tapering from the base to the acute apex, the distal part of the flagellum-joint carrying a series of four setules, and its tip being furnished with two which are longer than those on the side.

Lower Antennæ in the male not so thick as the upper, with only two joints distinguishable, the second much longer than the first, thick, with a blunt apex; in the female much smaller, tapering to an almost acute apex, with two minute setules side by side upon it.

Epistome deeper and broader than the *Upper Lip;* the latter with a rather deep oblique distal incision, making it as usual unequally bilobed.

Mandibles of the usual character, the molar tubercle very large, the palp not so long as the trunk, with its three joints but faintly separated, a character showing that the specimen was not fully adult. The mandibles in the female resembled those of the male, except in being without the palp.

First Maxillæ.—The outer plate appeared as usual triangular when seen in connection with the surface of the palp, but the distal margin with its row of unequal spines was seen to be far from acute, when the surface of the plate was seen and the palp turned edgewise. It is not easy to say whether there is any substantial difference either in the spines themselves or in their arrangement in the different species. There would seem to be some specific variation in the armature of the palp, but it is all of a minute order difficult to describe and not always easy to observe; in the present species the palp has a single comparatively large spine-tooth at the inner apex, the distal margin being cut into very slender sharp teeth, the series of which is continued some little way down the convex outer margin.

Second Maxillæ.—The outer plate longer than the inner, though not so much so as might be inferred from the figure *mx.*2, where the inner plate is foreshortened; in the lithographing all the spinules are given of equal thickness, but two or three of the apical spinules on each of the plates are in reality more spine-like than the rest.

Maxillipeds.—The inner plate as seen in profile almost triangular, beset with long

setules, and having a spinule on the apex attended by one or two smaller ones just below it; the outer plates narrow, more than half the length of the joint on which they stand, having three or four little spinules on the inner margin, one at the apex, and one just below it on the outer margin.

Triturating Organs.—As observed in the female, these are ovate with about thirteen spines round one side, the largest spines standing a little apart from the rest, which are graduated, diminishing in size as they retire from the largest.

First Gnathopods.—The upper boundary of the side-plates could not be distinguished, nor is it very clear in any of the segments. The first joint scarcely so long as the four following together, widening immediately below the neck with a considerable bulge of the front margin, below which it retains a breadth greater than that of the following joints; the second broader than long, with a spine at the hinder apex; the third a little longer but not broader than the second, its distal margin projecting behind the wrist and carrying two spines; the wrist broader but shorter than the hand, with a spine at the apex of the convex front margin, two on the straight hind margin, and one on and two within the slightly produced apex, which projects behind the hand; the hand has a spine some way above the apex, planted a little within the convex front margin, the hind margin straight, pectinate, and the distal margin minutely pectinate; the finger curved, more than half the length of the hand, at least half of the inner margin pectinate.

Second Gnathopods.—Branchial vesicles as long as the first joint and at the middle broader. The first joint with the front margin nearly straight, the hinder convex; the second joint with one spine at the hinder apex; the third joint with six spines set about its distal border; the wrist longer than the hand, being more produced than in the first gnathopods, with one spine at the apex of the front margin, one near the apex of the hind margin, and one on and several within it; the hand and finger as in the first gnathopods.

First Peræopods.—Branchial vesicles like the preceding pair. First joint widening from a narrow bent neck, the front margin then being straight and the hinder convex; the second joint longer than broad; the third joint shorter than the fourth, with a small spine at the apex of the hind margin; the fourth joint shorter than the fifth, the front margin convex, the hinder straight, loosely pectinate, with a spine at the apex; the fifth joint rather more closely pectinate; the finger slender, curved, more than half the length of the fifth joint, loosely pectinate along nearly half the inner margin.

Second Peræopods scarcely differing from the first, but with the fifth joint rather shorter.

Third Peræopods.—Branchial vesicles similar to the preceding pairs. First joint a little dilated, especially below, the hind margin nearly straight, the front convex, produced lower than the hinder, having two little spines, one above, the other below, the middle, and the distal part pectinate; the third joint shorter than the fourth, each with

a few little remote setules, and the fourth slightly pectinate; the fifth joint slender, considerably longer than the fourth, the front margin closely pectinate, with three or four setules at the distal end; the finger slender, curved, not half the length of the fifth joint, with two little spinules on the front margin just below the bulb of the base.

Fourth Peræopods.—The branchial vesicles less elongated than in the preceding pair, directed forwards. The limb similar to that of the third peræopods, but with the joints longer, four spinules on the front margin of the first joint, the third joint subequal in length to the fourth, and the finger without the two spinules.

Fifth Peræopods similar to the fourth but shorter; the first joint with three little spines on the front margin, the joint larger than in the third peræopods, a little shorter than in the fourth; the fifth joint shorter than in the third peræopods.

Pleopods.—The coupling spines small and slender, with a lateral pair of hooks below the apical pair; the arms of the cleft spine subequal, the margin of the joint above this spine being finely ciliated; the inner ramus with six joints, the outer with seven or with six; the first joint of the inner ramus narrow at the base, longer than the first joint of the outer ramus.

Uropods.—The peduncles of the first pair the longest, longer than the rami; the rami narrowly lanceolate, minutely pectinate on their adjacent margins, the longer inner ramus reaching back as far as the apices of the rami of the third pair; the peduncles of the second pair shorter than those of the third, longer than the rami, which are smaller than those of the first pair, otherwise similar; peduncles of the third pair much longer than the rami; the rami nearly equal, the inner nearly as long as the inner of the second pair, and the outer a little longer than the outer of that pair.

Telson rather more than half as long as the peduncles of the third uropods, of nearly equal length and breadth, in outline an inverted arch with the apex nearly acute, reaching as far as the apex of the peduncles of the second uropods.

Length, in the position figured, from the front of the head to the back of the second pleon-segment, scarcely more than one-tenth of an inch. One of the females with the marsupial plates fully developed was smaller than this.

Locality.—April 3, 1874; off Cape Howe, Australia; lat. 37° 33′ S., long. 149° 54′ E.; surface, night; surface temperature at midnight, 66°·5. Three specimens, one male, two females.

Remarks.—The species which seems to come nearest to this is that described and figured by Dana under the name "*Lestrigonus Fabreii?* Edwards," in the U.S. Explor. Exped., vol. xiii. pt. ii. p. 985, pl. lxvii. figs. 10*a–d*. Dana states that the last four segments of the peræon in his species are distinct and the first three coalesced along the back. The account he gives of the antennæ shows that he had an adult male specimen; of this he gives the length as "one and a half lines," whereas Milne-

Edwards says of his "*Lestrigonus Fabreii*," "long d'environ cinq lignes," a very considerable difference, seeing that he also was describing an adult male, besides that in Milne-Edwards' species only the first two segments of the peræon are coalesced. From Dana's species from the Sooloo Sea the Challenger one is distinguished by the fifth peræopods, which are decidedly shorter than the fourth, whereas in Dana's species they are both figured and specially described as being longer; in our species, moreover, the postero-lateral angles of the first three pleon-segments are squared, not rounded. The immature male and the female of "*Lestrigonus bengalensis*," Giles, 1887, show the peculiarity of having the first five segments of the peræon indistinctly divided or dorsally quite coalesced, but in that species the peduncles of the second uropods extend beyond those of the other two pairs, and the telson is figured as much wider than long.

Hyperia schizogeneios, n. sp. (Pl. CLXVIII.).

The Head much deeper than long, with a widely emarginate process, forming a sort of divided chin below the insertion of the lower antennæ; the peræon narrowing distally, but deeper throughout than the pleon, also much wider than the pleon, especially at the centre, the preponderance of the front over the hinder part of the animal giving it a top-heavy appearance; the first three or sometimes four segments of the peræon dorsally coalesced; the postero-lateral angles of the first three segments of the pleon squared, or the first almost rounded. The young while still in the egg, without indication of limbs, show the same preponderance of the front over the hinder part of the animal as the adult.

The Eyes occupying the whole surface of the sides of the head.

Upper Antennæ.—In the largest male specimen the peduncle has the usual three joints, and the flagellum has the usual large tapering first joint, which is followed by about twenty-three short joints, several of which are nearly as broad as long, the linear stage not having been reached. In the female the peduncle consists of a single joint, followed by a strongly tapering flagellum, also consisting of a single joint, very much longer than the peduncle, with four long filaments or pairs of filaments in a series on the inner side of the upper and thicker part.

Lower Antennæ.—In the male the last joint of the peduncle the longest, the flagellum similar to that of the upper antennæ, except that the first joint is not bulky, though nearly as long as the last joint of the peduncle, followed by twenty-one short joints, the last tapering to a point. In the female the peduncle consists of a short broad joint, and the flagellum of one scarcely longer, strongly tapering to an acute apex.

The Mouth-Organs of the female are shown *in situ* at the lower right-hand corner of

the Plate. The centre of the figure is occupied by the *Maxillipeds*, the outermost organs; these have a wide base supporting a narrow stem, on which stand the two outer plates, each of which has on its inner margin three small spines, one on the apex and one on the outer margin just below it; flanking the maxillipeds and partially concealed by them are the *Second Maxillæ;* these in turn partially overlie the *First Maxillæ*, the curving palps of which nearly meet within and underneath the outer plates of the maxillipeds; the apices of these palps being turned edgewise to the spectator appear narrower than they really are; they have in fact a small spine at the inner angle and a finely denticulate margin; the *Lower Lip* is shut out of view; the trunks of the mandibles are seen on either side of the bases of the first maxillæ, the outer margins bending rather sharply round and meeting just where the outer plates of the maxillipeds begin to separate; the distal emargination of the *Upper Lip* is also seen within the triangle formed by the separation of these plates. In the male the *Mandibles* have the usual three-jointed palp.

First Gnathopods.—The first joint as long as the four following together, dilated a little at about the middle of the front margin; the second joint not longer than broad; the third longer than the second, five-sided, with two slightly plumose spines on the straight distal margin, which projects behind the wrist and has the corner adjoining the wrist finely pectinate; the produced wrist as long as the hand, much wider, with one spine on the apex of the convex front, one on the straight hind margin, a larger one on its apex, and two smaller ones within the apex; the hand with one spine on the convex front margin some way above the apex, the hind margin pectinate; the finger curved, more than half the length of the hand, with much of the inner margin finely pectinate.

Second Gnathopods.—Branchial vesicles large, the upper part wide, the apical narrowed. First joint a little longer than in the preceding pair, the base a little wider than the part which follows and which is a little ridged on the inner surface; the joint is slightly widened below; the remaining joints are similar to those of the first gnathopods, but the second and third and the wrist are rather longer, the process of the wrist being more elongate, beset with six spines.

First Peræopods.—Branchial vesicles large, as are also the following pairs. In the figure *br.* four successive branchial vesicles are shown in their relative position overlapping one another. First joint bent at the narrow neck, then widening, rather longer than in the second gnathopods; second joint longer than broad; third a little longer than the second, narrow at the neck, then much widened, with one spine near the apex of the almost straight hind margin; fourth joint longer than the third, much broader than the fifth, with a spine above the middle and a larger one near the apex of the straight loosely pectinate hind margin; fifth joint longer than the fourth, slightly curved, with the hind margin pectinate; the finger about half the length of the fifth joint, slightly curved, with the inner margin near the base a little pectinate.

Second Peræopods like the first, but the first and fifth joints a little shorter. In all the limbs gland-cells can be seen in the first joint, but in the first and second peræopods they are much more conspicuous in the fourth than in the first joint.

Third Peræopods.—First joint more or less oval, the lower end the wider; the second joint a little longer than broad; the third shorter than the fourth, with a couple of minute setules on the front margin; the fourth joint shorter than the fifth, with the front margin pectinate; the fifth joint slender, very slightly curved, the front margin pectinate, and having a little apical inward curving spine; the finger slender, curved, about half the length of the fifth joint, with two little spinules on the front margin just below the dilated base.

Fourth Peræopods resembling the third, but with all the joints longer, and seemingly without the two little spinules on the finger.

Fifth Peræopods like the two preceding pairs, not longer than the third, the first joint narrower, the terminal joints scarcely pectinate.

Pleopods.—Coupling spines small, with two pairs of retroverted teeth; the cleft spine with the arms nearly equal, the longer one having, as is probably the case in the kindred species, a small dilatation near the apex, this dilatation being so placed as to antagonise with the other arm just below the dilated part of that arm; joints of each ramus six in number.

Uropods.—Peduncles of the first pair longer than the rami; the rami narrowly lanceolate, with the adjacent margins pectinate, the longer inner ramus more strongly than the outer; peduncles of the second pair a little longer than the outer ramus, shorter than the inner, the rami nearly as long as those of the first pair, which they nearly resemble; peduncles of the third pair nearly as long as those of the first, longer than the rami, which are subequal, the adjacent margins finely pectinate; in all the rami there is a scarcely perceptible pectination also of the outer margin.

Telson triangular, longer than broad, a little more than half the length of the peduncles of the third uropods.

Length, in the position figured, from front of head to extremity of uropods, just over one-tenth of an inch. Some of the specimens were much smaller.

Locality.—April 26, 1876; off St. Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface temperature, 73°·2.

Remarks.—The specific name—meaning divided chin, and derived from the Greek, σχίζω, I cleave, and γένειον, a chin—refers to the emarginate lower border of the head, which is a very conspicuous feature in this species. There are many points of resemblance between this species and *Hyperia dysschistus* found at the other side of the world, but the general shape and proportions are distinct, and the descriptions will have shown that in many minute details the two species differ. There is, however, a single specimen,

labelled "Zebu Harbour, Philippines, January 1875," which seems to be so close to *Hyperia schizogeneios* as scarcely to admit of being placed in a separate species. The features of difference which this specimen presents are that the head is less deep; the wrist of the first gnathopods has on the straight hind margin two spines, one on and three within the apex, and the straight hind margin of the hand is pretty strongly pectinate on the lower part; the third joint of the second gnathopods has four spines about the apex, the wrist has the produced part beset with eight spines, the hand has two on its front margin; in the first peræopods the fourth joint is rather conspicuously broad; the hinder corners of the first three pleon-segments are squared, but perhaps the actual angles a little more rounded than in the Atlantic specimen; the first two pairs of pleopods have seven joints to each ramus, the third pair has six; the telson is a little more elongate. In case further comparison should make it necessary to distinguish this form from the other, I should propose for it the name *Hyperia zebui*. The length of the specimen is just over one-tenth of an inch.

Hyperia gaudichaudii, Milne-Edwards (Pl. CLXIX.).

1840. *Hyperia Gaudichaudii*, Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 77.
1849. „ „ Nicolet, in Hist. fis. y pol. de Chile por Claudio Gay, Zool., t. iii.
1862. *Lestrigonus Gaudichaudii*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 289, pl. xlviii. fig. 3.
1887. *Hyperia Gaudichaudi*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 16.

A large stout species, the back, especially at the front part of the pleon, having an imbricated appearance; head shorter than its depth; peræon tumid, broader than the pleon; the first three pleon-segments with the postero-lateral angles acute, but the produced points quite minute; the specimens in spirits retaining a light or dark brown colour, but with the uropods pale or almost white, the back in general covered with innumerable specks of colouring darker than the ground-colour; one specimen curiously mottled with wavy dark markings. The liver tubes with a crenate outline; the heart narrow, strong-walled. The following description refers to a male specimen:—

Eyes occupying the sides of the head, dorsally separate, the dividing tract forming a small triangle at the hind margin, a large one above the upper antennæ, and a more or less narrow line between these triangular spaces.

Upper Antennæ.—First joint of the peduncle broader than long, the second and third successively narrower, and so short as to be transversely almost linear; first joint of the flagellum longer than the peduncle, broad, tapering, the breast carrying the usual brush of filaments; the second joint broader than long, the third not longer than broad, the following joints increasing in length, though not in regular gradation, slender, lightly ciliated.

Lower Antennæ.—The third (first free) joint of the peduncle stout, not longer than

broad, the second joint shorter and narrower, longer on one side than on the other, the third joint nearly as long as the first two together, the apical margin on one side deeply emarginate ; the first joint of the flagellum abruptly narrower than the last of the peduncle, widest near the base, longer than any of the five following joints, which are rather stouter than those of the upper antennæ, similiarly ciliated. In a complete antenna the joints of the flagellum are more than twenty in number.

Upper Lip deeper than broad, unequally bilobed by a rather deep incision of the distal margin.

Mandibles with the trunk broad, especially at the base, narrower distally, the upper front angle forming a small rounded lobe looking like the basal joint of the palp; below and just in front of this is another rounded angle, from which the margin descends to the small cutting plate, the edge of which is divided into ten little teeth ; the secondary plate of the left mandible is similar to the principal, and of nearly equal size ; behind these there is a strongly ciliated or spinulose tract; the molar tubercle is prominent, with broad crown carrying the usual long rows of denticles and cilia ; the first joint of the palp is shorter but broader than the second, with the hind margin convex till near the apex, the apical margin oblique ; the second joint is shorter than the third; the third is long, tapering to an extremely fine point, the almost straight front margin having the adpressed cilia projecting conspicuously beyond it. The lobe of the trunk which gives a four-jointed appearance to the palp is not separated at the base from the body of the trunk.

Lower Lip short, the front lobes wide apart, smooth ; the mandibular processes broadly rounded, as large as the front lobes.

First Maxillæ.—No distinct inner plate ; the outer plate broad, strongly ciliated or spinulose, and distally carrying five unequal spines, none of which are long, though two are very stout ; the palp longer but scarcely broader than the adjoining plate, with a noticeable spine at the apex of the inner margin, the apical and the distal half of the very convex outer margin being scabrous.

Second Maxillæ.—Both plates with the usual armature of slender cilia-like spines, the outer plate the longer, with two stronger spines on its narrow truncate apex, the inner plate having one such spine on, and one a little below, the apex.

Maxillipeds.—Second joint broad at the base, with a central ridge of the inner surface leading up to the strongly spinulose inner plate, which rises above the distal margin of the joint, and has one strong apical spine ; the outer plates small compared with the joint on which they stand, the inner margin of one plate (in the specimen examined) not armed exactly like that of the other, in each a few little spines and spinules on and near the inner margin and the narrow but obliquely truncate apex, below which there is a little furring of the outer margin.

First Gnathopods.—Side-plates here as in the following pairs with the upper boundary

distinctly marked; this pair deeper behind than in front. First joint of the limb, as in all the limbs of the peræon, broadly dilated, with a large space left free from muscles, the lower part of the front of the joint in the first four pairs and the corresponding hinder part in the last three being channelled; in the first gnathopods this joint is most dilated at a little distance from the base; the apex of the hind margin has three or four spines; the second joint broader than long, with six or seven spines round the hinder apex; the third joint rather longer than the second, with a dozen spines round the distal margin where it projects behind the wrist; the wrist widening distally, longer than the hand and much broader, with three spines on the front apex, one on the margin a little higher up, three or four groups on the hind margin, and others on the surfaces adjoining it, the distal margin which projects behind the hand being set with about a dozen spines; the hand having spines singly or in pairs at nine points of the slightly convex serrate front margin, others on both surfaces, the hind margin straight, pectinate, carrying five small spines; the finger little curved, finely pectinate nearly to the tip, more than half the length of the hand.

Second Gnathopods similar to the first but longer. Branchial vesicles of great size, fully as long as the first joint and much broader. The front margin of the first joint nearly symmetrically convex, so that the greatest breadth of the joint is near the middle; there are eighteen or more spines round the distal margin of the third joint, which projects behind the wrist as in the first pair, but is longer than there; the wrist is longer than in the first pair, narrower at the base but distally wider, and a little produced downwards, similarly armed, the distal margin in both cases having some fine pectination; the hand is a little longer and narrower, with fewer spines than in the first pair, otherwise similar, as is also the finger. The spines which have been mentioned have in most or all cases a delicate feathering on parts of two edges; the pectination is not uniform throughout, but for the most part consisting of two or three little points alternating with one that is larger.

First Peræopods.—Front margin of the side-plates more flattened than in the preceding pairs. Branchial vesicles large like the preceding and following pairs. The first joint rather longer than in the second gnathopods, of the same breadth, but broadest below the centre, and with the muscles running up nearer to the base; there are six or seven little spines distributed along the hind margin, and three at its apex; the second joint is a little longer than broad; the third is shorter than the fourth, with a scarcely perceptible pectination of the hind margin; the fourth is much shorter than the fifth, but somewhat wider, with three little distant spines on the hind margin, and some slight pectination about its apex, which is in no way produced, but projects behind the fifth joint; the fifth joint narrow, curved, its concave hind margin minutely pectinate, the pectination becoming a little stronger round the apex; the finger very short, not a quarter the length of the fifth joint, apparently quite smooth.

Second Peræopods.—Side-plates rather broader than the preceding pair, of somewhat pentagonal shape, but with all the angles rounded. The limb nearly as in the preceding pair, but the first joint more regularly oval, the third joint rather longer and the fourth rather shorter.

Third Peræopods rather shorter than the two preceding pairs. Side-plates broader than deep, rather deeper in front than behind. The first joint with convex front margin, the hind margin of the front surface almost straight till near the rounded apex, which projects behind the other margin and the following joint; some of the muscles almost reach the base of the joint; the following joints similar to those of the second peræopods, but without spines or pectination, the fourth joint less wide, the fifth joint shorter but fully as broad; the finger similar.

Fourth Peræopods.—The side-plates broader than the preceding pair, very much broader than deep. The branchial vesicles longer and broader than the first joint. The limb scarcely differing from the preceding, but the first joint rather broader and more oval, the third and fourth joints subequal in length, the fifth joint a little longer than in the third peræopods.

Fifth Peræopods like the fourth, but the side-plates less deep, the first joint rather larger and more oblong, the fifth joint shorter than in the third pair. The third, fourth, and fifth peræopods are as nearly as possible equal to one another, but shorter than the first and second.

Pleopods.—The cleft spine has the serrate arm much stouter than the other, which is also shorter and has a very small subapical dilatation; the first joint of the inner ramus, besides being ciliated above the cleft spine, has some five or six plumose setæ below it; the first joint of the outer ramus is also bordered with five or six plumose setæ; each ramus has from eighteen to twenty joints.

Uropods.—Peduncles of the first pair longer but narrower than those of the third, longer than the rami, the distal margin minutely pectinate; the rami set a little apart at the base, elongate lanceolate, the adjacent edges pectinate, near the base slightly emarginate and furred, the other edges smooth, the apices acute; the outer ramus a little shorter than the inner; the peduncles of the second pair a little shorter and narrower than those of the third, longer than the rami; the outer ramus shorter and much narrower than the inner, its inner margin pectinate, the inner ramus a little shorter than the rami of the first pair but much broader, the outer margin and lower part of the inner margin pectinate; this ramus scarcely reaches the middle of the rami of the third pair; peduncles of the third pair much longer than the rami, very broad except near the base, the lower part of the inner margin pectinate, its apex sharply squared; the rami subequal in length, the outer much the narrower, with its outer margin smooth, the inner pectinate; the inner ramus broadly lanceolate, with both edges pectinate.

Telson longer than broad, not half the length of the peduncles of the third uropods,

its greatest breadth not equalling their greatest breadth; the apex narrow, but rounded.

Length.—Some of the specimens were an inch in length, others much smaller; some were almost fully extended, others doubled up so that the tips of the uropods were just under the antennæ.

Locality.—Station 312, January 13, 1876; off Port Famine, Patagonia; lat. 53° 37′ 30″ S., long. 70° 56′ 0″ W.; depth, 10 to 15 fathoms; surface temperature, 47°·8. More than thirty specimens.

Remarks.—Milne-Edwards gives a very brief description of his species, which he says "Habite les mers du Chili." Spence Bate described it afresh and figured it under the name "*Lestrigonus Gaudichaudii.*" He says "It closely resembles *L.* [*Lestrigonus*] *exulans*, but may be at once recognised by the distinct armature on the propoda of the gnathopoda." It has many points of resemblance also to *Tauria macrocephala*, Dana, a mysterious species, of which Dana's description does not wholly agree with his figures, see U.S. Explor. Exped., pl. lxviii. fig. 2*d*. According to Bovallius, Arctic and Antarctic Hyperids, Spence Bate's *Lestrigonus exulans* is a synonym of Montagu's *Hyperia galba*, while Krøyer's *Lestrigonus exulans* is a synonym of Milne-Edwards' "*Hyperia Latreillei.*" Milne-Edwards only distinguishes *Hyperia gaudichaudii* from *Hyperia latreillii* by the antennæ, using characters which are now known not to be of specific value, but the figures given by Bovallius of *Hyperia latreillii* show that it must come extremely near specifically to *Hyperia gaudichaudii*, although the one is a northern, the other a southern, form.

Specimens belonging to the genus *Hyperia*, or to one of the closely related genera, were obtained at many localities, but there has not been time to examine them all; many of very small size, little or not at all over a tenth of an inch in length, have the characters of adult males or females, while many are almost certainly the young of larger species; whatever their age or size they have not been neglected as uninteresting, but simply because certain conditions of time and space to which this Report is subject have made it desirable to pass them over.

Genus *Hyperoche*, Bovallius, 1887.

1838. *Metoecus*, Krøyer, Grønland's Amfipoder, p. 291.
1840. „ Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 78.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 981, 1442.
1862. *Hyperia* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 292.
1864. „ „ Fritz Müller, Für Darwin (translation, p. 77).
1865. „ „ Goës, Crust. amph. maris Spetsb., p. 18.
1868. „ „ Bate and Westwood, Brit. Sess. Crust., vol. ii. pp. 519, 520.

1869. *Metoëcus*, Norman, Last Report on Dredging among the Shetland Isles, p. 287.
1870. *Metoecus*, Boeck, Crust. amph. bor. et arct., p. 6 (86).
1872. *Tauria*, Boeck, De Skand. og Arkt. Amph., p. 88.
1879. *Hyperia* (*pars*), Edward, Smiles' Life of a Scotch Naturalist, p. 435.
1882. *Tauria*, Sars, Oversigt af Norges Crustaceer, pp. 19, 75.
1882. *Hyperia* (*pars*), Bovallius, On some forgotten Genera among Crust. Amph., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 10, No. 14, p. 17.
1885. „ „ Carus, Prodromus Faunæ Mediterraneæ, p. 422.
1886. „ „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 491.
1887. *Hyperoche*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 18.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 563.
1887. „ Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 58.

For the original definition of *Metoecus*, see Note on Krøyer, 1838 (p. 179). The name being preoccupied must yield to *Hyperoche*, for the definition of which see Note on Bovallius, 1887 (p. 588). In his Arctic and Antarctic Hyperids Bovallius adds the observation that :—

"*Hyperoche* is easily distinguished from *Hyperia*, its nearest relative, by the form of the carpal processes of the first two pairs of pereiopoda [*First* and *Second Gnathopods*] being compressed, knife-shaped, sharply serrated. Also the carpi of the third and fourth pair [*First* and *Second Peræopods*] are different in form, with serrated hinder edges, or dilated as in the genera *Parathemisto* and *Euthemisto*. The general habitus is very similar to that of *Hyperia*." Hansen considers that both "*Hyperoche Kroeyeri*," Bovallius, and "*Hyperoche Luetkeni*," Bovallius, should be made synonyms of *Hyperoche medusarum* (Krøyer). Sars unites Boeck's *Tauria abyssorum* with Krøyer's species, and it is probable enough that *Hyperoche prehensilis* (Bate and Westwood) is only a young male of that species; its chief distinction, the dilated fifth joint in the peræopods, is shown by Fritz Müller to be a character of the young. Bovallius gives "*Hyperoche Martinezi*" as the name of Fritz Müller's "*Hyperia Martinezii*," and in view of the wording of Bovallius' generic definition it may be noticed that in that species the fourth joint or carpus of the first peræopod is figured by Müller[1] with serrated hinder edge *and* dilated. These two characteristics are also combined in the first peræopods of the Challenger species, though they are not very strikingly developed. In *Hyperoche medusarum* (Krøyer) Hansen found the fourth joint prolonged downwards in a serrate process only on the first peræopods, and not also on the second.

Hyperoche cryptodactylus, n. sp. (Pl. CLXX.).

The Head short, not specially deep; all the segments of the peræon distinct, the pleon deeper than the peræon, the postero-lateral angles of the first three segments produced in short sharp points. Liver-tubes very large; heart large and with strong walls,

[1] Für Darwin, trans., p. 77.

extending with almost undiminished breadth to near the end of the sixth peræon-segment.

The Eyes occupying the sides of the head almost completely.

Upper Antennæ.—Peduncle with the first joint as broad as long, the two following joints short; first joint of the flagellum stout, tapering, longer than the peduncle, with a thick brush of not very long filaments, the second joint narrower than the apex of the first, a little longer than broad, with a couple of filaments, the third, fourth, and fifth joints successively longer and narrower; there were six other linear joints remaining, each of them rather longer than the fifth joint.

Lower Antennæ.—Third (first free) joint of peduncle rather broader than long, the fourth shorter and narrower than the third, the fifth nearly as long as the third and fourth together; the first joint of the flagellum nearly as long as the peduncle, abruptly narrower, a little bulbous at the base, then linear; part of the second joint remaining, the rest of the flagellum missing.

Upper Lip unequally bilobed by a small triangular distal emargination.

Mandibles.—The trunk long and narrow, with the palp fixed at the upper front corner, and the small cutting plate projecting from the lower front angle; the edge of the cutting plate divided into ten or eleven little teeth; the secondary plate of the left mandible having its edge divided into ten teeth, which are smaller than those on the larger principal plate; between the cutting plate and the straight part of the lower margin there is a convex piece thickly set with long bristles, and above this there is a slightly projecting molar tubercle having its lower front angle armed with a tuft of bristles; the palp longer than the trunk, the first joint broader but shorter than the second; the second is in a line with the first, narrowest at the middle; the third is as long as the two preceding together, tapers to a fine point, is set at an angle to the second, and has its outer surface covered with adpressed cilia. It should be noticed that the molar tubercle in these organs differs strikingly from that in *Hyperia* and *Euthemisto.*

Lower Lip.—The distal and inner margin flattened, strongly ciliated; the mandibular processes short, with rounded apices.

First Maxillæ.—Inner plate wanting; the outer plate broad, partially folded, the distal part set all round with spines, of which many are like fine bristles, while others are proper spines; the palp reaching much beyond the outer plate, the inner margin fringed with closely set cilia, the rounded distal margin finely pectinate; there are also many groups of pectinate markings on the adjoining surface; there is a longitudinal fold of the inner surface starting from the base, and there are two or three scattered spinules on the outer surface.

Second Maxillæ.—The inner plate much shorter and apically more obtuse than the outer, both of them having the distal part beset with numerous bristle-like spines.

Maxillipeds.—The joint which carries the plates is at the base broader than the

extreme length, narrowing distally, but with the distal margin still broad, convex in the centre; the inner plate small, not projecting beyond the base of the outer plates, the latter not very much shorter than the joint to which they are attached; on the straight, sparingly serrate inner margin there are half a dozen spinules, there is one spinule at the apex, and one in a little notch of the outer margin just below it.

The Triturating Organs appear to have a feeble armature.

First Gnathopods.—The first joint as long as the third, fourth, and fifth together, expanded, the front margin convex, channelled along the lower half as in the following limbs, having the gland-cells conspicuous and numerous; the second joint about as long as broad; the third joint with a short front margin and a long straight smooth hind margin, having two spines upon and two within the produced apex; the trunk of the wrist nearly as long as the hand, the produced hinder part not quite so long as the hand, having the hinder margin and adjacent surface finely furred and carrying some minute spinules at intervals, the apex acute, the front or inner margin divided into about twenty-four teeth, near which there are four or five setules; the long narrow hand has two or three setules on the slightly convex front margin, the hinder margin being divided into about twenty-eight teeth, near to which there are a few setules; the narrow apical border is, like that of the trunk of the wrist, microscopically pectinate; the finger is small, curved, having the inner margin just below the base pectinate with half a dozen little teeth.

Second Gnathopods very similar to the first. Branchial vesicles of great size, much broader than the first joint. The first joint longer but scarcely broader than in the preceding pair, the third joint rather shorter, the hand rather longer; the inner margin of the process of the wrist has twenty-eight teeth, the margin of the hand facing it has thirty-four; there is a minute setule at the tip of the finger. In these gnathopods, and apparently in the first also, the finger can be retracted into the hand for almost its whole length, if not for the whole length (see the enlargement of fig. *gn.*2).

First Peræopods.—Branchial vesicles like the following pairs very large. The first joint longer than in the second gnathopods but less wide, the front margin convex, the hinder nearly straight; the second joint longer than broad, wider below than above; the third joint rather long and almost smooth-edged; the fourth joint longer than the third, with the hinder edge finely pectinate, produced into a little point, the distal margin also finely pectinate, and this on the inner surface not lying parallel with the outer but running obliquely up towards the hind margin; the fifth joint slender, set on to the front of the distal end of the preceding joint, which therefore projects behind it; the hind margin is finely pectinate. The apex of the fifth joint and the finger broken off.

Second Peræopods.—The first joints like those of the first pair, but the pectination of the fourth joint seemed to be slighter. The rest of the limb missing.

Third Peræopods.—First joint not so long as in the preceding peræopods, a little

wider, especially just below the neck ; the second joint a little, and the third considerably, larger than in the preceding pairs. The rest of the limb missing.

Fourth Peræopods.—The first three joints as in the preceding pair, but the first a little larger ; the fourth joint curved as in the other peræopods, and longer than the third joint. The two other joints missing.

Fifth Peræopods.—The first joint rather larger than in the preceding pair, the third and fourth joints not so long, the fourth with the apical margin finely pectinate ; the fifth joint curved, slender, tapering, longer than the fourth joint ; its margin pectinate ; the finger missing.

Pleopods.—Coupling spines moderately strong ; the cleft spine stout, the longer arm denticulate within, and slightly widened apically beyond the dilatation of the other arm ; the inner ramus with twelve joints, the outer with thirteen.

Uropods.—Peduncles of the first pair much narrower, and only a little longer, than those of the third, reaching back very little beyond those of the second, longer than the narrow elongate rami ; the outer ramus rather shorter than the inner, pectinate on the inner margin, the inner ramus reaching back not quite to the apex of the outer ramus of the third uropods, pectinate along the outer margin and the lower part of the inner ; near the bases these rami have little confronting emarginations ; peduncles of the second pair intermediate in breadth, a little longer than the longer inner ramus ; the outer ramus much the shorter and narrower, strongly pectinate on the inner margin, the inner ramus pectinate on both margins, more closely on the outer somewhat sinuous margin ; the peduncles of the third pair very broad, much longer than the rami, their pectinate inner edges overlapping as soon as they meet just below the telson ; the broad distal border also partially pectinate ; the outer ramus the longer, with straight outer margin, the inner convex, pectinate ; the inner ramus broadly lanceolate, with both margins pectinate.

Telson scarcely so long as broad, rather more than a third of the length of the peduncles of the third uropods, a bluntly pointed arch in outline.

Length, from the front of the head to the back of the second pleon-segment, about one-fifth of an inch.

Locality.—Station 141, December 17, 1873 ; near the Cape of Good Hope ; lat. 34° 41′ S., long. 18° 36′ E. ; surface ; surface temperature, 66°·5. One specimen, male.

Remarks.—The specific name, derived from the Greek κρύπτω, I conceal, and δάκτυλος, a finger, refers to the retractile terminal joint in the gnathopods. It is of course likely enough that this character, though first observed in the present species, may be common to all the species of the genus, since in other respects they are separated only by small distinctions.

Genus *Hyperiella*, Bovallius, 1887.

1887. *Hyperiella*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 19.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 565.

For the definition of this genus, see Note on Bovallius, 1887 (p. 589). In his work on the Arctic and Antarctic Hyperids, Bovallius adds the observation that "this genus is a link between *Hyperia* and *Euthemisto*, the form of the body and of the first two pairs of pereiopoda [*First* and *Second Gnathopods*] resembles *Hyperia*, but the elongated fifth pair [*Third Peræopods*] and the long urus [afterpart of pleon] verge to *Euthemisto*."

Bovallius includes the little *Hyperia pupa* of Costa, from the Mediterranean, doubtfully in this genus, but the large telson and short small third uropods scarcely reaching beyond the telson make such an inclusion altogether improbable; for a different suggestion, see Note on Costa, 1857 (p. 297). Bovallius includes Dana's *Lestrigonus fuscus*, from the Mid-Atlantic, in this genus apparently without hesitation, but though Dana describes and figures the third peræopods as a little longer than the fourth and fifth pairs, he draws the fifth joint as of about the same length in all the three pairs, although in the ascertained species of this genus that joint is strikingly more elongate in the third peræopods than in the two following pairs.

Hyperiella dilatata, n. sp. (Pl. CLXXI.).

Head deep and broad, not long; all the peræon-segments distinct, the peræon in dorsal view broadly oval, the distal end the narrower; the pleon abruptly more compressed than the peræon, the postero-lateral angles of the first three segments produced in short sharp points. The liver tubes large, the heart narrow. The description is taken from the female.

The Eyes occupying all the surface of the head with the exception of a small triangular space in front above the upper antennæ, and a small postero-dorsal triangle.

Upper Antennæ inserted rather below the centre of the front of the head; the first joint of the peduncle longer than broad, twice as long as the second, which is about twice as long as the third; the flagellum consisting of one long tapering joint, curving a little outwards, two and a half times as long as the peduncle, the lower half of the inner margin fringed with setules not closely set.

Lower Antennæ more slender than the upper, the flagellum of which they about equal in length; the terminal (or third free) joint of the peduncle cylindrical, rather longer than either of the preceding joints; the flagellum of one straight tapering joint, more than once and a half as long as the peduncle, having a few small cilia or microscopic setules on various parts.

Upper Lip unsymmetrically bilobed, apparently with the surface very minutely furred near the small distal emargination.

Mandibles with a rather short trunk, the cutting edge small, divided into ten little teeth; the secondary plate of the left mandible (figured on the right hand of the Plate) much narrower than the principal, and apparently with fewer teeth; the molar tubercle broad and prominent, having on one edge of the crown a series of about twenty-one little spine-like teeth standing apart from one another, on the other edge a row of broad denticles, and several rows of minute denticles on the face of the crown; the palp is narrow, longer than the trunk, the first joint more than half the length of the second, which curves a little outwards, the third tapering, rather longer than the second.

Lower Lip.—The forward lobes not broad, wide apart, the rounded distal margins strongly ciliated; the mandibular processes rounded, divergent.

First Maxillæ.—Outer plate short and broad, distally folded, beset with strong bristles, and distally carrying five stout spines, two of which are of rather conspicuous size; the palp broad, reaching beyond the outer plate, having a longitudinal fold or ridge rising from the base, the inner margin closely fringed with spinules till within a little of the toothed apex, just within which the distal margin has a stout little double pointed spine-tooth, beyond this being cut into about a dozen little denticles; several little spines or prickles are set on the surface, a little below the distal margin.

Second Maxillæ.—The outer plate longer than the joint on which it stands, apically pointed but not acutely, thickly set with bristles and spines, the two of the latter at the apex being tolerably strong; the inner plate much shorter, not very dissimilar.

Maxillipeds short; the inner plate very inconspicuous when the maxillipeds are viewed from the outer surface; the principal joint has on this outer surface just within the distal margin a fan-like arrangement of five large spines, the distal half of each finely feathered, the central spine the longest; the outer plates are not much shorter than the joint on which they stand, the inner margin almost smooth for more than half its length from the base, then serrate and fringed with a number of little spinules of different sizes; the apex has a spinule and there are two or three minute ones on the outer margin just below the apex.

First Gnathopods.—Side-plates deeper than broad, the upper boundary pretty distinctly marked in this and the following pairs. The first joint about as long as the third, fourth, and fifth joints together, of nearly uniform breadth throughout, channelled along the lower three-fourths of the front margin; there are two spines at the apex of the hind margin; the second joint not longer than broad, with three spines at the hinder apex; the third joint widening distally and a little produced, projecting behind the wrist, the produced apical border beset with several strong spines, the hind margin smooth except for a little pectination at the apex; the wrist widening distally so as to be there much broader than the hand, the front margin smooth, with two apical spines, the

hind margin having a couple of spines at two successive points and a little pectination, the slightly produced and strongly projecting apex being beset with at least six spines; the hand slightly curved, about as long as the wrist, the convex and serrate front margin carrying a series of five spines, the surfaces having four apiece, the hind and distal margins being finely pectinate; the finger slender, curved, more than half the length of the hand, its inner margin for some distance from just below the base being pectinate.

Second Gnathopods.—Branchial vesicles not quite so long or so broad as the first joint, widening gradually to the distal end. The marsupial plates broader and rather longer than the branchial vesicles. The first joint longer and broader than in the preceding pair, not channelled in front, having three spines at the apex of the hind margin, and some prickles on the rounded front apex. The second joint as in the first pair, but the third joint considerably more elongated, with at least nine spines round the produced distal margin behind; the wrist with the hinder process reaching beyond the middle of the hand, the front or inner margin of the somewhat folded process having several spines, the apex of the front margin carrying three; the hand is more elongate than in the first pair, the front margin having a single spine near the base, then two pairs, and a single spine at the apex, this margin being as in the first pair furry rather than pectinate, while the hinder and apical margins and part of the inner margin of the finger are definitely pectinate; finger more than half the length of the hand.

First Peræopods.—Branchial vesicles and marsupial plates like those of the second gnathopods but larger. First joint longer but not broader than in the second gnathopods, narrow at the neck, the front margin nearly straight, the hinder carrying six small spines at irregular intervals; the second joint distally widened, longer than broad, with two small spines on the hind margin, and one on its slightly produced acute apex; the third joint much shorter than the fourth, distally widened, the hind margin straight, carrying three little spinules, and near the acute apex a strong spine. The fourth joint shorter but broader than the fifth, with a spinule or two on the convex front margin, the straight hind margin pectinate, carrying three spines and a stronger one at the apex, the distal margin a little pectinate, and on the inner surface curving upwards behind. The fifth joint elongate, slightly curved, the hind margin pectinate, the surface armed with four small spines, the distal margin pectinate; the finger slender, not half the length of the fifth joint, pectinate with seven little teeth on the inner margin near the base.

Second Peræopods.—Branchial vesicles distally much more widened than the preceding pair; marsupial plates like the preceding pair. The limb not materially differing from the preceding, but without the surface spines on the fifth joint.

Third Peræopods.—The branchial vesicles wider above than below. The marsupial plates smaller than in the preceding pair. The first joint widened a little below, the hind margin nearly straight, channelled, the front rather convex, apically acute; the second joint longer than broad, distally widened, apically acute, and slightly pro-

duced; the third joint much shorter than the fourth, having a small setule here and there; the fourth joint very much shorter but wider than the fifth, the front and apical margins pectinate; the fifth joint like the fourth slightly curved, very long, the front margin pectinate; the finger little more than a quarter as long as the fifth joint, pectinate with seven or eight little teeth on the inner margin near the base. In a second specimen the fourth joint showed a tolerably conspicuous spine at the apex of the front margin.

Fourth Peræopods.—Branchial vesicles broader near the base than the preceding pair. The first joint shorter, scarcely dilated distally, with a spine at the acute apex of the front margin, and another a little higher up; the second and third joints resemble those of the preceding pair, with the front apex even more strongly produced; the fourth joint is shorter than in that pair, and the fifth joint only about half the length, so that it is only a little longer than the fourth joint of its own pair; the finger is short, curved, not pectinate.

Fifth Peræopods.—The side-plates very shallow. The limb like the preceding pair, but with the first joint rather shorter, having but one spine on the front margin at the apex; the fourth joint is also shorter, so that it is very little longer than the third.

Pleopods.—The coupling spines blunt-headed, with two pairs of retroverted teeth below the apical pair; the cleft spine short and stout, the two arms nearly equal, the longer undilated arm showing two serrulate edges; each ramus having ten joints. In a second specimen the rami had only nine joints apiece.

Uropods.—The first and second pairs missing, the third pair with very long peduncles, of which the inner margin is apically produced into a short sharp point; the inner ramus not half the length of the peduncle, rather narrowly lanceolate, serrate on both margins. In the dorsal view of the whole specimen, at the top of the Plate, the peduncles of the third uropods are foreshortened, and for that reason do not appear to be twice the length of the rami. A second specimen already referred to shows that the relative dimensions are variable; peduncles of the first pair narrower than those of the third, and not longer, the rami long and slender, the outer the shorter, denticulate and finely pectinate on the inner margin, the inner as long as the peduncle, pectinate on both margins, denticulate on the inner and on the lower part of the outer; peduncles of the second pair shorter than those of the first, the rami bearing the same proportion to the peduncle and being armed as in the first pair; the rami of the third pair subequal, more than half the length of the peduncle, ornamented as in the other two pairs. In a very small specimen the rami of the third pair are quite as long as the peduncles.

Telson triangular, longer than broad, less than half, but more than a third of the length of the peduncles of the third uropods.

Length.—The specimen of which the full figure is given measured a quarter of an inch from the front of the head to the extremity of the uropods.

Locality.—February 21, 1874; Antarctic Ocean; lat. 63° 30′ S., long. 88° 57′ E.; surface; surface temperature, 32°·5. Three specimens, one very small; and on the same date, surface to 100 fathoms, four specimens, of which three are very small.

Remarks.—The specific name refers to the greatly dilated peræon. *Hyperiella antarctica*, Bovallius, 8 to 12 mm. in length, from "Antarctic Seas around Cape Horn," differs from the present species in several small particulars, but very obviously in having the postero-lateral angles of the first three pleon-segments rounded instead of acutely produced.

Genus *Euthemisto*, Bovallius, 1887.

1825. *Themisto*, Guérin, Encycl. Méth., t. x., Art. Uroptera.
1828. „ Guérin, Mém. de la Soc. d'Hist. Nat. de Paris, t. iv.
1829. „ Latreille, Le Règne Animal, t. iv.
1829. „ Straus-Durckheim, Mém. du Mus. d'Hist. Nat., t. xviii.
1830. „ Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 394 (extr., pp. 34, 42).
1831. „ Latreille, Cours d'Entomologie.
1835. „ Ross and Owen, App. to Narr. of Ross' Second Voyage.
1836. „ Guérin-Méneville, Iconographie du Régne Anim., t. ii., t. iii.
1837. „ Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. „ Milne-Edwards, Hist. Nat. d. Anim. sans vertèbres, t. v.
1838. „ Krøyer, Grønlands Amfipoder, p. 291.
1840. „ Lucas, Hist. Nat. des Crust. Arachn. et Myriap., p. 235.
1840. „ Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 84.
1842. „ Krøyer, Naturh. Tidsskr., R. 1, Bd. iv. Hfte 2, p. 143.
1852. „ Dana, Amer. Journ. Sci. and Arts., ser. 2. vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1005, 1442.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 311.
1865. „ Goës, Crust. Amph. maris Spetsb., p. 17.
1868. „ Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 522.
1870. „ Boeck, Crust. amph. bor. et arct., p. 7 (87).
1871. „ Cunningham, Trans. Linn. Soc. Lond., vol. xxvii. p. 498.
1871. „ Buchholz, Erlebnisse der Mannschaft des Schiffes Hansa.
1872. „ Boeck, De Skand. og Arkt. Amph., Hfte 1, p. 86.
1874. „ Verrill and Smith, Invert. Anim. Vineyard Sound, p. 451 (745).
1875. „ Schiødte, Krebsdyrenes Sugemund, Naturh. Tidsskr., R. 3, Bd. x. p. 229.
1879. „ Claus, Der Organismus der Phronimiden, p. 2.
1879. „ G. M. Thomson, Trans. New Zealand Inst., vol. xi. p. 242.
1886. „ Forsstrand, Crustacea Malacostraca (Arctic distribution), pp. 36, 54.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 490.
1886. „ Koelbel, Crust. Pycn. und Arachn. von Jan Mayen, p. 8.
1887. *Euthemisto*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 21.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. pp. 568, 575.
1887. „ Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 59.

For the original definition of the genus *Themisto*, see Note on Guérin, 1828 (p. 133). Bovallius in 1887, finding that the name *Themisto* was preoccupied, changed it into *Euthemisto*, for which he gives the following definition :[1]—

"This genus differs from *Hyperia* by the narrow, gauge-shaped carpal process of the second pair of pereiopoda [*Second Gnathopods*]; the carpus of the first pair being broad but not produced. From *Parathemisto* it differs by the strong development of the fifth pair [*Third Peræopods*]; this latter characteristic however is not of any higher value, as there are transitions between the two genera."

It may be added that *Euthemisto* is distinguished from *Hyperia*, *Hyperoche*, and *Hyperiella* by the stronger development of the inner plate of the maxillipeds.

Euthemisto bispinosa (Boeck).

1870. *Themisto bispinosa*, Boeck, Crust. amph. bor. et arct., p. 8 (88).
1872. „ „ Boeck, De Skand. og Arkt. Amph., p. 87, pl. i. fig. 4.
1887. *Euthemisto bispinosa*, Bovallius, Systematical List of the Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 22.
1887. „ „ Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 569, pl. xlvi. figs. 97–103.
1887. *Euthemisto compressa* (*pars*), Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 59.

In large specimens there is a bulge of the frontal margin on either side just below the rostral point; the back is carinate along both the peræon and pleon, developing a dorsal tooth produced backwards from the centre of the hind margin in each of the last two or three segments of the peræon, and the first three or four of the pleon, in large specimens the tooth being very prominent in the last two segments of the peræon and the first two of the pleon; the smaller the specimen the less important is the size of the teeth.

In Boeck's very brief account of the species it is stated that the last three pairs of peræopods have the first joint very narrow, not dilated, and of the third peræopods in particular it is said that the first joint is only slightly dilated, with a convex front and straight hind margin, and that the limb itself is little longer than in the following pairs. In the Challenger specimens, if they be rightly referred to this species, the third peræopods are very considerably longer than the fourth or fifth, in agreement with Boeck's figure; the first joint is of the shape usual in the genus, being channelled behind.

Bovallius says of this species, "it is characterized by the carinated, serrated dorsal side, by the carpal process of the second pair of pereiopoda [*Second Gnathopods*] being shorter than the metacarpus, provided with a terminal spine, by the irregularly triangular carpi of the third and fourth pairs [*First and Second Peræopods*] being as long as the metacarpi [fifth joint], by the very short exterior rami of the uropoda, and by the small semicircular telson, not equalling a fifth of the length of the peduncles of the last pair of

[1] Arctic and Antarctic Hyperids, p. 568.

uropoda." He gives the length as 15 to 30 mm., and the habitat as Greenland, Spitzbergen. The telson, though very small, is as long as the breadth at the base, and is therefore nearer to half an oval than to half a circle, alike in Bovallius' figure and in the Challenger specimens.

Hansen considers that *Themisto compressa*, Goës, and *Themisto bispinosa*, Boeck, are the same species, the former grounded on the young, the latter on the adult. In specimens 7 mm. long, he has found, he says, the last three peræopods of equal length, and though in the third pair the fifth joint was longer than in the two following pairs, the fourth joint was somewhat shorter. In some specimens 8 to 9 mm. long he found the differences between these limbs extremely small, and in larger specimens he found all sorts of gradations in the differences of length. It must, however, be remarked that Goës clearly had the adult before him as well as the young, for he says, "*T. compressa* n., carinata, segmentum septimum sæpe etiam sextum et octavum margine postico in spinulam productum dorsalem in juvenibus exiguam, in adultis facile conspicuam; antennæ ♂ flagello multiarticulato, tenuissimo, valde elongato ut in Hyperiis omnino." In Goës' figure the fifth peræopod is actually longer than the third or fourth. The Challenger specimens are numerous and of many different sizes, from one-quarter to three-quarters of an inch in length, and in the development of the dorsal teeth they vary greatly, but though many were examined especially with a view to this question, none of them in the least agreed with the figure given by Goës of the last three peræopods of his *Themisto compressa;* but the small specimens just as well as the large showed a very marked superiority of size in the third peræopods over the fourth and fifth. I do not, therefore, in the present state of the evidence, feel justified in accepting Professor Hansen's view that *Parathemisto compressa* (Goës) is the same species as *Euthemisto bispinosa* (Boeck).

Length, as above stated, varying from about one-quarter to three-quarters of an inch.

Localities.—Station 50, May 21, 1873; off Halifax, Nova Scotia; lat. 42° 8′ N., long. 63° 39′ W.; surface; surface temperature, 45°. Numerous specimens.

Station 46, May 6, 1873; off Nova Scotia; lat. 40° 17′ N., long. 66° 48′ W.; surface; surface temperature, 40°. Two specimens.

Remarks.—In one of the two specimens from the second locality, there is on one side of the animal a dwindled third peræopod, and the companion limb has perhaps not attained its full size, since the fourth joint is considerably larger than in the following pairs, while the fifth joint is very little larger.

Euthemisto gaudichaudii (Guérin) (Pls. CLXXII., CLXXIII.).

1828. *Themisto Gaudichaudii*, Guérin, Mém. de la Soc. d'Hist. nat. de Paris, t. iv. pl. xxiii.
1830. „ „ Milne-Edwards, Ann. d. Sci. Nat., t. xx. p. 393 (extr., p. 42).
1836. „ „ Guérin-Méneville, Iconographie du Règne Anim., t. ii. pl. xxv. fig. 7.
1838. „ „ Milne-Edwards, Hist. nat. des Anim. sans vert., t. v.
1840. „ „ Milne-Edwards, Hist. nat. des Crust., t. iii. p. 84.
1840. „ „ Lucas, Hist. nat. des Crust., des Arachn. et des Myriap., p. 235, pl. xviii. fig. 5.
1862. „ „ Spence Bate, Brit. Mus. Cat. Amph. Crust., p. 314, pl. iv. fig. 10.
1862. „ *Guerinii*, Spence Bate, Brit. Mus. Cat. Amph. Crust., p. 313, pl. i. fig. 9.
1887. *Euthemisto Gaudichaudi*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 21.
1887. „ „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 568.

Back little compressed, and not dorsally dentate. Second segment of the peræon the shortest; the first three segments of the pleon with the lower margin slightly serrate, the postero-lateral angles produced very slightly into acute points.

Upper Antennæ.—First joint of the peduncle longer than broad, the two following joints very short; the flagellum much longer than the peduncle, tapering, having a serrate inner margin and about a dozen pairs of filaments on the inner side, the end narrow, curved.

Lower Antennæ.—Third (first free) joint of the peduncle not longer than broad, the fourth longer than the third, and the fifth than the fourth; the flagellum slender, tapering, longer than the peduncle, either consisting of one long joint, or with a long first joint followed by a few or several short joints.

Upper Lip about as broad as its depth, unsymmetrically bilobed, one side of the distal emargination more oblique than the other.

Mandibles.—The cutting plate with fourteen little teeth, of which the lowest is the largest, standing a little apart from the rest; the secondary plate of the left mandible has an extremely narrow neck, with a front edge about two-thirds the width of that of the principal plate, against which it is so closely applied that the twelve little teeth are not easy to count; the right mandible is without a secondary plate, and on the principal plate the lowest tooth and the lowest but one are larger than the rest; behind the cutting plates there is a large bunch of spines, some of which are almost hair-like; the molar tubercle is large and prominent, with the usual rows of denticles, the row on the inner margin of the crown containing more than twenty teeth stouter than those on the surface of the crown, and attended each by a setule; the palp is placed on a little raised base which sometimes looks like an incipient joint; the palp itself is long and slender, the first joint shorter than the third, the two together about as long as the second, which is more or less bent, more in large specimens than in small; the third joint is apically acute.

Lower Lip.—The principal lobes distally squared and strongly ciliated; the mandibular processes apically narrowed.

First Maxillæ.—The outer plate has the somewhat narrowed distal half enveloped in spines, some of which are long and hair-like, others moderately slender, and some at the apex stout, of various lengths, three of them conspicuously strong; the one-jointed palp is considerably larger than the adjoining plate, its outer margin convex, smooth till near the apex, then a little serrate, a series of teeth and spines passing round the distal margin, the inner corner of which is raised and truncate, occupied by a short broad spine-tooth; the nearly straight inner margin is serrate with numerous sharp teeth and bordered with spines and spinules.

Second Maxillæ.—The inner plate shorter and rather broader than the outer, both distally beset with numerous spines of various lengths and thicknesses, and each having at the apex one longer and stronger than the rest; another strong one is planted a little below the apex, this and the apical spine being longer on the outer than on the inner plate.

Maxillipeds.—The inner plate is three-sided, long and narrow, the inner sides armed each with an oblique row of slender spines, the apex truncate and having a small spine-tooth on each of its slightly projecting corners; the outer plates longer than the inner one, not very broad, the outer margin convex, the inner a little concave, except near the base, a little serrate, armed with several long spines besides numerous spinules; the apex not quite acute.

First Gnathopods.—The first joint about as long as the third, fourth, and fifth together, with spines round the hinder apex, a little channelled distally in front; the short second joint similarly armed; the third joint a little longer than the second, with straight hind margin, distal spines, and a moderately acute front apex resting on the wrist; the wrist longer and broader than the hand, the front margin slightly convex, smooth, with submarginal spines, the hind margin serrate, fringed with spines, not apically produced downwards, but projecting a little beyond the hand, the surfaces also carrying some spines; the hand with convex front margin, the front nearly straight, at the middle finely pectinate, strongly at and near the apex; there are several spines on the surfaces, and one in general conspicuously projecting from near the middle of the front margin; the finger curved, a little more than half the length of the hand, the inner margin strongly pectinate for the first half, more finely for much of the remainder. The spines, at least as a rule, are finely pectinate.

Second Gnathopods.—First joint not widened above as in the first pair, but longer than in that pair, equal to the third, fourth, and fifth joints together; the first and second joints with spines round the apex behind; the third joint much longer than the second; its distal margin, which is much higher up in front than behind, is almost encircled with spines; the front apex resting on the wrist is a little produced; of the wrist the proximal part is rather longer than the hand, the produced distal part rather

shorter; this is fringed with spines along the margin facing the hand and at the apex, which is not quite acute; the hand is longer and straighter than in the first gnathopods, with fewer surface spines and perhaps less pectination; the finger is as in the preceding pair, but not more than half the length of the hand.

First Peræopods.—The first joint narrow above and widened below, with sinuous slightly serrate front margin, the hinder convex, carrying a few little spines; the second joint with some small spines on the hind margin; the third joint not longer than the second, but distally wider, with spines along the faintly pectinate hind margin; the fourth joint (or wrist) large, ovate, the front margin convex, smooth, with spines at the apex, the inner surface carrying some spines, the hind margin finely pectinate and fringed with numerous spines, this margin in large specimens being sinuous, since in such specimens the apical part of the joint is narrowed almost abruptly; the fifth joint as long as, or longer than, the fourth and folding against it, narrow, curved, with convex front margin, the hind margin concave, pectinate; the finger slender, smooth, curved at the tip, not half the length of the fifth joint.

Second Peræopods similar in general shape and armature to the first, but with all the joints except the second larger, the first joint longer and of more uniform breadth, the fourth much longer and broader, the fifth only a little longer, so that in this pair it is shorter than the fourth joint.

Third Peræopods.—The side-plates broad and shallow. The first joint channelled behind, in front somewhat bowed out near the middle, with several spines along the front margin, of which the upper part is smooth; the second joint short, almost smooth; the third joint widening distally, as long as the distal breadth, with some spines along the front, and at the apex of the hind margin; the fourth joint considerably longer than the first, distally narrowed, with numerous spines along the serrate front margin, and some also along the hind margin; the fifth joint is much longer and narrower than the fourth, with a bulbous base; the front margin has a few spines, but is chiefly distinguished by the pectination, which near the base is faint, but grows stronger and stronger as it approaches the apex; the finger short and slender, a little curved.

Fourth Peræopods much shorter than the third, the inequality depending on the first, fourth, and fifth joints; the first joint channelled behind, with spines along the lower half of the sinuous front margin; the second joint short; the third as long as in the preceding pair, similarly armed, much narrower; fourth joint rather shorter than the first, with spines along both margins, numerous on the faintly pectinate front, and slender feathered spines along the inner surface; the fifth joint slightly curved, narrower than the fourth, rather longer than the first, with spines along the slightly convex and serrate hind margin, others along the pectinate front margin, with slender spines on the adjacent surface; the finger slender, smooth, almost straight, not a quarter the length of the fifth joint.

Fifth Peræopods similar to the fourth, the first joint perhaps a little longer, with some spines on the lower part of the inner hind margin; the third joint narrower, with some spines on its inner surface; the fourth joint shorter and narrower than in the preceding pair; the fifth joint slightly shorter than in the preceding pair, with the hind margin smooth, and the front having a very faint pectination, which, instead of becoming stronger towards the apex, is entirely absent from the lower part of the joint.

Pleopods.—The cleft spine placed at the middle of the long first joint, with the serrate arm a little longer than that which bears the narrow subapical dilatation; the first joint of the outer ramus having a tongue-like interlocking process, and carrying three or four setæ on a bulge of the outer margin near the centre; the joints of the inner ramus numbering from thirteen to fourteen, of the outer from fourteen to fifteen.

Uropods.—Peduncles of the first pair longer than the rami, which are rather long and narrow, the outer shorter and narrower than the inner; the adjacent margins of the two rami in all three pairs finely pectinate; the peduncles of the second pair rather shorter but broader than those of the first, the inner apex acute; the outer ramus shorter and much narrower than the inner, shorter than the outer ramus of the first pair, the inner ramus a little shorter than the peduncle, with which it appears to be almost coalesced, a little shorter but broader than the inner ramus of the first pair; peduncles of the third pair the broadest and longest, the rami respectively broader than those of the first pair, and nearly as long.

Telson small, triangular, the breadth at the base equalling the length.

Length of the two largest specimens, three-fifths of an inch.

Localities.—January 23, 1874; off the north-east coast of Kerguelen Island; surface; surface temperature, 40°·5. A large number of specimens, most of them not full grown.

Station 302, December 28, 1875; off Patagonia; lat. 42° 43′ S., long. 82° 11′ W.; surface; surface temperature, 55°. Six specimens, not adult.

Station 314, January 21, 1876, Cape Virgins to Falkland Islands; lat. 51° 35′ S., long. 65° 39′ W.; surface; surface temperature, 48°. Numerous specimens, not adult.

Remarks.—In the first instance I regarded the Kerguelen specimens, one of which is figured on Pl. CLXXII., as distinct from the South American, one of which from Station 302 is figured on Pl. CLXXIII.; but the differences appear to depend upon the age of the specimens, in the young ones the process of the wrist of the second gnathopods being less outdrawn than in the adults, and similarly the fourth joint in the first and second peræopods being much less widened, the fifth joint of the third peræopods less elongate, and the back of the animal less compressed. The type-specimen described and figured by Guérin was taken by M. Gaudichaud at the Falkland Isles. Bovallius, Arctic and Antarctic Hyperids, p. 568, says of this species, that "it is characterized by the carpal process of the second pair of pereiopoda [*Second Gnathopods*] being provided with long

hairs, without terminal spine, by the exterior and interior rami of the uropoda being equal in length, and by the minute, triangular telson." He gives the length as "26 mm.," as though he had seen and examined a specimen, since Guérin's measurement is "long de neuf lignes." The hairy wrists of the second gnathopods and the equal rami of the uropods agree with Guérin's figures, but Guérin makes no mention of these characters in his text, and the figures by themselves certainly cannot be trusted. If all the particulars of Guérin's account were to be accepted, his species would be unique, since he gives four joints to the mandibular palp, only five joints apiece to the gnathopods and peræopods, and can find no joints at all in the maxillipeds. Whether the southern specimens here described belong to Guérin's species or not, they certainly bear a very striking resemblance to the northern species, *Euthemisto libellula* (Mandt), in some of its stages of growth.

Euthemisto thomsoni, n. n. (Pls. CLXXIV., CLXXV.).

1879. *Themisto antarctica*, Thomson, Trans. New Zealand Inst., vol. xi. p. 243, pl. xd. figs. 2, 3 (*non* Dana).
1886. „ „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 151.

Peræon and *Pleon* carinate, the last three segments of the peræon and the first three of the pleon having the hind margin produced into a strong dorsal tooth; the peræon broad at the centre, especially in the female; the first three segments of the pleon laterally ridged, with the postero-lateral angles produced into small acute points.

Upper Antennæ.—First joint of the peduncle longer than broad, the two following very short; the flagellum in the female consisting of a single joint, long, tapering, sharply curved at the tip, with small spines and setules round the convex margin, the concave margin rather deeply serrate till near the apex, a fringe of slender filaments projecting from a parallel inner margin; in the male the flagellum terminates in several slender joints.

Lower Antennæ.—Third (first free) joint of the peduncle little longer than broad, fourth considerably longer than the third, fifth longer than the two together; flagellum in the female consisting of one slender, tapering joint, considerably longer than the peduncle; in the male the flagellum has a long first joint followed by several short ones.

The Mouth-Organs agree so closely in all their main features with those described for *Euthemisto gaudichaudii* that it is unnecessary to do more than refer to the figures on Plate CLXXV.

First Gnathopods closely agreeing with those of *Euthemisto gaudichaudii.*

Second Gnathopods differing little from those of *Euthemisto gaudichaudii*, unless in having the process of the wrist longer, reaching nearly to the extremity of the hand.

First Peræopods.—The armature and general structure of both the first and second peræopods are similar to those in *Euthemisto gaudichaudii*, but in the particular specimen

figured the fourth joint is a long oval, more than twice as long as broad, thus in the adult making an approach to the shape which the joint has in the young; the fifth joint as long as the fourth, with pectinate hind margin; the finger smooth, gently curved, not half the length of the fifth joint.

Second Peræopods similar to the first; the first, third, and fourth joints rather longer, the fourth also a little broader; the fifth joint scarcely so long as the fourth.

Third Peræopods.—The first joint about equal in length to the first in the following pair, with spines along the front margin of the somewhat widened lower part; the second joint short, with minute spinules in front; the third joint nearly twice as long as the distal width, with spines along the front margin, at the apex of the hind margin, and one as in the other species higher up that margin; the fourth joint longer than the first, more than twice the length of the third, narrowing a little distally, with spines along both margins, but most along the front; the fifth joint in the specimen figured as long as the third and fourth together, much narrower than the fourth, a little bulbous at the base, gently curved, with a few spines on the upper half of the convex hind margin, the concave front margin fringed with spines and finely pectinate, not more strongly near the apex than higher up, though with three or four strong teeth at the apex; the finger short, curved, smooth. The fifth joint in other specimens is straight, longer than the third and fourth joints together, with pectination increasing towards the apex, agreeing in shape with this joint in the other species, yet apparently not attaining the same proportionate length (see fig. *prp.*3.A).

Fourth Peræopods differing little from the third; the third joint narrower, but if anything rather longer; the fourth joint about four-fifths of the length of that in the preceding pair, not dilated at the upper part, with spines along each of the serrate margins and on the inner surface; the fifth joint not a great deal shorter than in the preceding pair, rather broader, with spines on the edges and the inner surface, the front margin finely pectinate; the finger as in the third peræopods.

Fifth Peræopods similar to the fourth, but with the first joint rather longer, the inner of the two hind margins having spines on the lower part; the fifth joint rather longer than in the fourth pair, with spines on the surface, but the hind margin not serrate or spined and the front not pectinate.

Pleopods.—The cleft spine as in *Euthemisto gaudichaudii* both in form and position, and as in that species the first joint of the inner ramus has two plumose setæ at the distal end of the inner margin; in the pleopod examined the joints of the inner ramus were sixteen in number, of the outer seventeen.

Uropods.—The peduncles of the first pair narrower than those of the second and scarcely so long, rather longer than the long and narrow inner ramus; the outer ramus also narrow, rather more than half the length of the inner; in all the pairs the adjacent edges of the two rami are finely pectinate; peduncles of the second pair as broad as

those of the third, distally a little broader, with the inner apex acutely produced; the inner ramus broadly lanceolate, almost as long as the peduncle, longer than any of the other rami; the outer ramus much narrower and shorter, longer than the outer ramus of either of the other pairs; peduncles of the third pair longer than those of the second; the rami respectively a little smaller than those of the second pair.

Telson triangular, a little longer than the breadth at the base, not a quarter the length of the peduncles of the third uropods, the apex slightly rounded.

Length of the specimen figured, more than nine-tenths of an inch.

Localities.—Station 146, December 29, 1873; between Marion Island and the Crozet Islands; lat. 46° 46′ S., long. 45° 31′ E.; surface, daytime; surface temperature, 43°. Two specimens about nine-tenths of an inch long, three about six-tenths of an inch, seven or eight a quarter of an inch or less.

Station 147A, January 1, 1874; off Crozet Islands; lat. 46° 45′ S., long. 50° 42′ E.; surface; surface temperature, 42°. One specimen.

Station 158, March 7, 1874; in the Southern Ocean; lat. 50° 1′ S., long. 123° 4′ E.; surface; surface temperature, 45°. Three specimens.

March 9 and 10, 1874; south of Australia; lat. 48° 18′ S., long. 130° 4′ E.; surface; surface temperature, 50°. Six specimens.

Remarks.—The species appears to stand extremely near to the northern *Euthemisto bispinosa* (Boeck). The peculiarities of the fourth joint in the first and second peræopods and of the fifth joint of the third peræopods in the specimen figured from Station 146 are, I think, only individual peculiarities. They led me to suppose that the species belonged to the genus *Parathemisto* (see Note on G. M. Thomson, 1879, p. 500). In Dana's *Themisto antarctica*, to which Mr. Thomson assigns the species, the back is not dentate, and the third peræopods are, as in other species of this genus, very strikingly longer than the fourth and fifth. The present species therefore seems to me to be distinct, and as the name *antarctica* is preoccupied, I have renamed it in compliment to Mr. G. M. Thomson.

Numerous small specimens, labelled "February 2, 1874, Antarctic Ocean, surface," and "February 3, 1874, between Kerguelen and Heard Island, surface," appear to belong to this species, the third peræopods not being elongate, but the specimens are young,[1] with the backs rounded not dentate, the wrist process of the second gnathopods not very elongate.

One specimen, from Station 149B, January 17, 1874, lat. 49° 28′ S., long. 70° 30′ E., 25 fathoms, measuring seven-tenths of an inch, is distinguished from the rest by having the third peræopods very long, the dorsal teeth proportionately to the length of the animal very small, and the head and body scabrous with a fine down. Should it be necessary to separate this specimen from the other, I would propose for it the name *Euthemisto scabra*.

[1] Compare Hansen's remarks on the young of *Themisto bispinosa*, quoted p. 1409.

Euthemisto australis, n. sp.

Back very slightly or not compressed; first three segments of the pleon large, with the postero-lateral angles produced into acute points and the lower margins serrulate.

Upper Antennæ.—First joint of the peduncle nearly as broad as long, the two following joints short; first joint of the flagellum broad and long, fringed with a brush of filaments, the second and third joints very short, followed by eight slender joints.

Lower Antennæ.—Gland-cone conspicuous, the three free joints of the peduncle as in the other species; the flagellum (in the male) of many long and slender joints, together sometimes nearly as long as the animal.

Mouth-Organs so far as observed similar to those in the other species, but in the mandibular palp the second joint is about twice as long as the first and a very little longer than the third.

The Gnathopods agree closely with those of small specimens of *Euthemisto gaudichaudii* (see Pl. CLXXIII.).

First Peræopods.—The first joint narrow at the neck, which is a little bent, widened below, with two little spines on the lower part of the hind margin; the front margin channelled below; the second joint with two spines on the hind margin; the third joint widening distally, longer than the second joint, the hind margin nearly straight, very hairy, carrying three little spines; the fourth joint longer than the third, widening distally, the hind margin continuous with that of the preceding joint, and hairy like that, carrying four spines, not so long as the front margin which is smooth and a little convex, the inner surface having a row of five unequal spines, the distal margin sinuous, projecting behind the fifth joint, on the inner surface minutely pectinate; the fifth joint longer but much narrower than the fourth, the front margin convex, smooth except for a few little spinules, the hind margin straight, pectinate, and carrying six or seven spinules, the inner surface armed with eight unequal spines; the finger curved, smooth, scarcely half the length of the fifth joint.

Second Peræopods similar to the first, except in the first joint which is longer, and the fourth which is longer and scarcely so broad, forming a narrow oval, without the characteristic distal widening found in the preceding pair, so that below the lowest spine of the hind margin there is here a further tract of that margin, which in the preceding pair is bent so as to form part of the distal margin; the fifth joint not longer than the fourth, and not longer than the corresponding joint in the first peræopods.

Third Peræopods.—First joint narrow above, widened below, channelled behind, with the outer margin triflingly serrate, the sinuous front margin having some small spines; the second joint short; the third more than twice as long as the second, the straight front margin hairy, carrying some spinules, and at the apex a spine, and a smaller one within the apex, the hind margin produced into a subacute apex carrying a

spine; the fourth joint not wider than the third, about twice as long, nearly as long as the first joint, the front margin hairy, fringed with eight spines, the hinder margin having spines at the apex and two or three higher up; the fifth joint slender, longer than the fourth or the first, with a very slight curve, the front margin carrying five spines, and at first hairy, the hairiness passing into strong pectination towards the apex; the finger slender, smooth, distally a little curved, about a fourth the length of the fifth joint; in the specimen specially examined, the fifth joint in one of these limbs was not so long as in the other, so that the finger was more than a quarter of the length.

Fourth Peræopods not differing much from the third, the first joint about as long but rather less widened below, with four spines on the lower part of the front margin, the third joint as long but less widened distally, the fourth joint much shorter, scarcely once and a half the length of the third, with five unequal spines along the hairy front margin, the fifth joint nearly as long as the third and fourth together but shorter than in the preceding pair, with spines along the front margin, others more slender on the inner surface, and two or three on the hind margin, the front hairy near the base, but pectinate for almost the whole length; the finger nearly a third of the length of the fifth joint.

Fifth Peræopods similar to the fourth, the first joint a little longer, with three spines on the lower part of the front margin, the straight outer hind margin with only a single indent, the inner hind margin having as usual some spines near the apex; the third joint rather longer and narrower, the fourth rather shorter and narrower, than in the preceding pair; these two with little spinules at intervals along the otherwise smooth front margin, the fourth joint not once and a half as long as the third, with six unequal spines projecting from the inner surface; the fifth joint as long as or a little longer than the third and fourth together, the hind margin smooth, the front armed only with little spinules, but with five unequal spines projecting from the inner surface; the finger between a third and a fourth of the length of the fifth joint.

Pleopods.—Coupling spines with three pairs of retroverted teeth below the half-moon-shaped apex; cleft spine placed below the middle of the first joint of the inner ramus, the serrate arm the longer, the subapical dilatation of the other arm small; a single plumose seta on the outer margin of this joint in the third pair; two such setæ in the first and second pairs; the first joint of the outer ramus has three or four setæ on the bulging part of the outer margin; each ramus has eleven or twelve joints.

Uropods.—Peduncles of the first pair scarcely longer than the inner ramus, the outer ramus much shorter than the inner, the adjacent margins strongly pectinate, bulging near the base so as to overlap one another, but contracting a little below the base, the other margins smooth; the peduncles of the second pair broader but shorter than those of the first, not so long as the inner ramus, the apex of the inner margin acutely produced; the outer ramus little more than half the length and less than half the breadth of the broadly lanceolate inner ramus, the adjacent margins of the two rami strongly pectinate; peduncles

of the third pair broad except at the base, rather longer than those of the first pair, the apex of the inner margin acutely produced; the outer ramus about half the breadth of the inner, more than half its length, reaching back as far as the inner ramus of the first pair, its inner margin strongly pectinate; the inner ramus shorter than the inner ramus of the first or the second pair, both margins strongly pectinate except near the base.

Telson less than a third of the length of the peduncles of the third uropods, about as long as the breadth at the base, somewhat triangular, but the sides and apex much curved.

Length about a quarter of an inch.

Locality.—March 15, 1874; south-west of Melbourne; lat 39° 45′ S., long. 140° 40′ E.; surface; surface temperature, 60°·2. Several specimens.

Remarks.—The specific name refers to the southern locality at which the species was found. The shape of the fourth joint in the first peræopods, the hairy margins in this and the three following pairs, and the pectination on both edges of the inner ramus of the third uropods are the distinguishing features of the species.

A specimen, not in very good order, from Station 162, April 2, 1874, off East Moncœur Island, Bass Strait, surface, appears to belong to this species. The first joint of the flagellum of the upper antennæ has a narrow apical prolongation, within which can be seen several small joints in preparation, and this is followed by six short joints.

Genus *Parathemisto*, Boeck, 1870.

1870. *Parathemisto*, Boeck, Crust. amph. bor. et arct., p. 7 (87).
1878. *Lestrigonus*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 5, vol. i. p. 411.
1878. *Hyperia*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 5, vol. ii. p. 487.
1882. *Parathemisto*, Sars, Oversigt af Norges Crustaceer, pp. 20, 75.
1886. „ Forsstrand, Crustacea Malacostraca, pp. 16, 53.
1866. *Themisto*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 490.
1887. *Parathemisto*, Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 20.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 566.
1887. „ Hansen, Oversigt Dijmphna-Togtet inds. Krebsdyr.
1887. „ Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 59.
1888. „ Robertson, Catal. of Amph. and Isop. Firth of Clyde, p. 65.

For the original definition of the genus, see Note on Boeck, 1870 (p. 397). *Hyperia oblivia*, Krøyer, 1838, appears to be the earliest described species belonging to this genus, but according to Hansen, Malacostraca marina Groenlandiæ occidentalis, p. 57, that species is itself involved in great obscurity, since Krøyer states that he had but a single specimen, and the single specimen in the Copenhagen Museum referred by Krøyer to this species is only, Hansen says, a small *Hyperia latreillei*. On the other hand, he thinks

that this is probably not Krøyer's original specimen, but that Krøyer was really describing a specimen of *Parathemisto*, as his figures indicate; in that case, however, he considers that there is little or nothing to separate *Parathemisto oblivia* (Krøyer) from the later *Parathemisto abyssorum*, Boeck, of which he has found several specimens from Greenland in Krøyer's collection. Under these circumstances it is reasonable that the specific name *oblivia* should be dropped on the ground of uncertainty and insufficient description. The next species claiming admission into the genus is *Hyperia trigona*, Dana, 1852, "length six to eight lines," coming "probably from the Lagulhas Bank, near Cape Horn." The Brit. Mus. Catal. Amph. Crust., p. 297, gives the measurement of this species as "Length $\frac{6}{20}$ths of an inch = '6–8 lines' (Dana)." Bovallius, Arctic and Antarctic Hyperids, p. 568, renames the species *Parathemisto trigona*, but gives the measurement as "*Length* 25–30 mm.," adding "*Hab.* Off Cape Horn (Dana)." For *Hyperia oblivia*, Spence Bate, 1857, Bovallius gives the name *Parathemisto longipes*. The species is rather obscure, but such as it is, it must bear the specific name *gracilipes*, proposed by Norman in 1869. The remaining species included in the genus are *Parathemisto compressa* (Goës), 1865, and *Parathemisto japonica*, Bovallius, 1887.

Parathemisto pacifica, n. sp.

The lower margins of the first three pleon-segments a little serrate and produced into small acute points; the hind margin bulging out beyond the postero-lateral angles.

Upper Antennæ.—First joint of the flagellum (in the male) as long as all three joints of the peduncle, with fourteen pairs of filaments along the convex margin, the apex narrowed; fourteen joints follow, of which the first is the shortest, a little longer than broad.

Lower Antennæ.—Last joint of the peduncle considerably longer than the preceding joint; first joint of the flagellum the longest, nearly as long as the last of the peduncle, but much more slender, a little bulbous at the base; sixteen slender joints follow in the specimen examined.

Upper Lip.—The distal emargination making one lobe half an oval, the other nearly square, yet with the end a little convex.

Mandibles.—The trunk compact, much shorter than the palp; the cutting edge with fourteen denticles, of which the lowest is the largest, a little apart from the rest; the secondary plate of the left mandible widens from a narrow neck, its broad distal edge having thirteen denticles which lie very near to those of the principal plate; behind the cutting plates there is the usual tuft of spines and the broad denticulate molar tubercle; the first joint of the palp is straight, elongate, yet shorter than the third; the second joint is slightly bent, longer than the third.

Lower Lip.—The distal margin of the principal lobes flattened, strongly ciliated.

Maxillæ similar to those in the genus *Hyperia*.

Maxillipeds.—The inner plate tolerably elongate.

First Gnathopods.—First joint a little widened at the upper part; the second joint with slender spines about the hinder apex; the third joint not much longer than the second, with front apex acute, resting on the wrist, the hinder apex having three or four pectinate spines; the wrist longer than the hand, having pectinate spines at two points of the convex front margin, the hind margin fringed with several spines, some being at the apex, which projects a little squarely behind the hand; the hand much wider at the base than the apex, with spines at five points of the very convex front, the hind margin nearly straight, strongly pectinate with about twenty teeth; the finger curved, more than half the length of the hand, its concave inner margin pectinate with slender teeth for more than half its length.

Second Gnathopods.—Branchial vesicles shorter but broader than the first joint. The first joint widening a little distally, its front margin not bulging; the third joint much longer than in the preceding pair, having no acute apex, most of it surrounded with spines; the proximal part of the wrist rather longer than the hand, the apical process behind three-quarters of the hand's length, fringed within with fine pectination and with spines, of which a strong one at the apex reaches beyond the apex of the hand; the hand rather longer and narrower than in the first pair, similarly armed; the finger pectinate.

First Peræopods.—The first joint with narrow neck, then widened, having spines at three points of each margin, those of the more convex hind margin all rather near the apex; the second joint with two spines on the slightly furred hind margin; the third joint with spines at four points of the hind margin, which is strongly furred; the apex of the front is produced downwards and armed with spines; the fourth joint is considerably longer than the third, with spines at three points of the slightly convex front margin; the hind margin nearly straight, strongly furred, having several spines on or near it, distally projecting beyond the fifth joint, and the distal margin minutely pectinate; the fifth joint rather longer than the fourth, the hind margin pectinate, the front convex; the finger curved at the tip, more than half as long as the preceding joint, having a little pectination of the inner margin.

Second Peræopods longer than the first, the fifth joint not longer than the fourth, the finger about half the length of the fifth joint.

Third Peræopods.—The first joint channelled and straight behind, the front margin with spines at eight points of the widened lower part of the joint; the second joint with a spinule and small spine on the front margin; the third joint elongate, with two spines and a spinule on the faintly pectinate front margin, and two or three spines at the slightly downdrawn hinder apex; the fourth joint much longer than the third, scarcely narrowed distally, with four spines spaced along the pectinate front margin, two

or three spinules along the hind margin, and a spine at its apex; the fifth joint much longer and more slender than the fourth, with a little spine high up on the convex hind margin, and one a little lower down on the pectinate front margin; the finger slender, curved at the tip.

Fourth Peræopods rather longer than the third; the first joint with eight spines along the front margin, which is almost straight like the hind margins; the second joint as in the preceding pair, the third joint more elongated than in that pair, the fourth joint with one or two additional spines, and the fifth joint more elongate, with four spines on each margin; the finger about a quarter of the length of the preceding joint. The branchial vesicles to this pair are much broader at the upper part than is the case with the preceding pairs.

Fifth Peræopods shorter than the third pair; the first joint rather longer than in the fourth pair, but the third, fourth, and fifth joints shorter, with the front margin not pectinate as in the other two pairs.

Pleopods.—The peduncles with some slender marginal spines; the cleft spine with the arms nearly equal, that with the subapical dilatation slightly the longer, the other conspicuously roughened on the inner side; the rami slender, with ten joints apiece.

Uropods.—Peduncles of the first pair a little longer than the inner ramus; the rami elongate, the outer considerably shorter than the inner, the adjacent margins strongly pectinate, with a slight emargination near the base, in which the teeth are very closely set; peduncles of the second pair shorter than the inner ramus, which is longer and much broader than the outer; the outer just reaching beyond the peduncle of the third pair; the adjacent margins of the rami strongly pectinate, the teeth being themselves to some extent pectinate; the peduncles of the third pair as long as those of the first and broader, considerably longer than the rami, the inner apex produced, acute; the rami reaching a little beyond those of the first pair, the apices very narrow and acute, the outer ramus narrower and a little shorter than the inner, pectinate only on the inner margin, the inner pectinate on both margins with pectinate teeth, but at the upper part of the inner margin not toothed, only very finely pectinate.

The Telson scarcely longer than the breadth at the base, scarcely a third of the length of the peduncles of the third uropods, the sides converging with a gentle curve to a narrowly rounded apex, which does not reach the meeting point of the inner margins of the peduncles just mentioned.

Length, three-tenths of an inch.

Locality.—Station 240, June 21, 1875; Pacific, between Japan and the Sandwich Islands; lat. 35° 20′ N., long. 153° 39′ E.; surface; surface temperature, 64°·8. Seven specimens; the specimen described, a male.

Remarks.—The specific name refers to the ocean in which the species was captured.

From *Parathemisto japonica*, Bovallius, the present species is distinguished by having the fifth joint of the first peræopods longer, instead of shorter, than the fourth, and pectinate, instead of smooth; and also by having the third peræopods longer than the second, and the rami of the third uropods unequal. In having the fourth peræopods longer than the third or fifth, the two species are in agreement.

Family Phrosinidæ.

In 1852 Dana placed the genera *Phronima* and *Primno* in the subfamily Phronimidæ, and the genera *Anchylomera*, *Phrosina*, *Themisto*, in the subfamily Phrosinidæ. In 1862 Spence Bate placed the genera *Phrosina*, *Primno*, and *Anchylomera* in the subfamily Phrosinides. For the same three genera, as first subfamily or first group of the Phronimidæ, Claus in 1879, Carus in 1885, and Gerstaecker in 1886, resumed the name Phrosininæ. In 1887 Bovallius, without change as to the genera, instituted the family Anchylomeridæ, for which, I think, the name Phrosinidæ should be preferred by right of inheritance from the terms Phrosininæ and Phrosinides, as well as in deference to its derivation from the eldest of the genera. The definition which Bovallius gives for the family is as follows :—

"Head mediocre, a little tumid, not deeper than the body. Eyes large, occupying the sides of the head. First pair of antennæ fixed at the anterior side of the head, with multiarticulate flagellum (in the male). Second pair fixed at the inferior side of the head, multiarticulate (in the male), or wanting (in the female). Mandibles with palp. Epimerals [side-plates] distinct. Seventh pair of pereiopoda [*Fifth Peræopods*] reduced or transformed. Peduncles of uropoda laminiform, without rami."

It cannot, however, be stated without reserve that the mandibles have a palp, since in the genus *Phrosina* that appendage has not yet been detected[1] in either sex, and, though present in the male, it is wanting in the female, as well in *Anchylomera* as in *Primno*. In regard to *Phrosina* and *Anchylomera*, it is scarcely accurate to say that the head is not deeper than the body, although there is none of that extreme prolongation noticeable in *Phronima* and *Phronimella*. The eyes in this family are divided each into two groups of ocelli, though the groups are contiguous on the surface. The side-plates are not invariably distinct, but distinct in some segments of the peræon and not in others. It would be better to describe the uropods as laminiform, undivided, without mention of peduncles or rami.

[1] Risso's statement on the subject, quoted on the next page, can scarcely be accepted without corroboration.

Genus *Phrosina*, Risso, 1822.

1822. *Phrosina*,[1] Risso, Journal de Physique, de Chimie et d'Hist. Nat., t. xcv. p. 241.
1825. *Phrosine*, Desmarest, Consid. gén. sur la classe des Crustacés, p. 258.
1825. „ Latreille, Familles nat. du Règne Animal, p. 289.
1825. *Phrosina*, Guérin, Encyclopédie Méthodique, t. x. Art. Uroptère.
1826. „ Risso, Hist. Nat. de l'Europe Mérid., t. v. p. 91.
1829. *Dactylocera*,[2] Latreille, Le Règne Animal, t. iv. p. 117.
1830. „ Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 393 (extr., pp. 34, 42).
1831. *Dactylocera* (*pars*),[3] Latreille, Cours d'Entomologie.
1837. „ Burmeister, Handbuch der Naturgeschichte, Abth. ii., Zool.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertébres, t. v.
1840. *Phrosine*, O. G. Costa, and A. Costa, Catalogo de' Crost. del Regno di Napoli.
1840. *Dactylocera*,[4] Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 238.
184–. *Dactylocera*,[5] Milne-Edwards, Le Règne Animal, Illustrated Edition.
1840. *Phrosina*, Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 89.
1851. *Phrosine*, Costa, in Hope's Catalogo dei Crost. Italiani, p. 21.
1852. *Phrosina*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1442.
1853. *Phrosine*, Costa, Fauna del Regno di Napoli.
1858–1874. *Phrosina* or *Dactylocera*, Chenu and Desmarest, L'Encycl. d'Hist. Nat., Crustacés, p. 49.
1862. *Phrosina*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 318.
1862. „ Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. x. p. 440.
1878. „ Spence Bate, Brit. Assoc. Report for 1877, pp. 42, 46.
1878. „ Claus, Zool. Anzeiger, Jahrg. i. p. 270.
1879. „ Claus, Der Organismus der Phronimiden, p. 3.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 422.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 488.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 27.

For the original definition of the genus, see Note on Risso, 1822 (p. 117), and for a fuller definition, see Note on Risso, 1826 (p. 128). For the brief account of *Pisitoe*, see Note on Rafinesque-Schmaltz, 1814 (p. 87), and for the confused account of *Dactylocera*, see Note on Latreille, 1829 (p. 137). Risso includes in his definition of the genus "mandibules palpigéres," but after an interval of sixty-six years the statement is still in need of confirmation. Milne-Edwards denies it, saying, Hist. Nat. des Crust., t. iii.

[1] Milne-Edwards, Costa, and Boeck consider that *Pisitoe bispinosa*, Rafinesque-Schmaltz, 1814, is probably a synonym of Risso's later *Phrosina semilunata*, but they have not felt justified by Rafinesque's brief description in accepting his names for the genus and species.

[2] Latreille in this work gives *Phrosina*, Risso, but transfers the type species, *Phrosina semilunata*, to his own genus *Dactylocera*, assigning to Risso's genus Risso's second species *Phrosina macrophthalma*, which is a doubtful one, and *Cancer galba*, Montagu, which certainly does not belong to *Phrosina*.

[3] In this work Latreille confuses *Vibilia* and *Phrosina* together under the name *Dactylocera*.

[4] In the Note on Lucas, 1840, at p. 184 the name is wrongly given as *Dactylocerus*, the original form as quoted by Desmarest from Latreille MS.

[5] As the plate containing *Dactylocera nicæensis* is referred to in the Hist. Nat. des Crust., t. iii. p. 91, the date is perhaps earlier than 1840.

p. 90, note, "Dans l'espèce que j'ai examinée, il n'existait aucun vestige d'appendice palpiforme inséré aux mandibules; mais dans la figure que M. Costa a donnée de ce genre, on voit de chaque côté de la bouche un petit appendice sétacé qui paraîtrait être un palpe mandibulaire, et qui est considéré par ce naturaliste comme une seconde paire d'antennes; il serait possible que ces appendices ne fussent autre chose que les pièces terminales des pates-mâchoires devenues plus saillantes que d'ordinaire." The small appendages here referred to are placed too high up in Costa's figure to admit of the explanation offered by Milne-Edwards, but they are also too low down to admit of Costa's own explanation; they are perhaps the projecting tips of the first pair of gnathopods. Spence Bate agrees with Milne-Edwards in giving "Mandibles without an appendage," but he probably bases the statement only on the examination of a female specimen.

Phrosina semilunata, Risso (Pl. CLXXVI.).

1822. *Phrosina semilunata*, Risso, Journal de Physique, de Chimie et d'Hist. Nat., t. xcv. p. 245.
1825. *Phrosine semilunata*, Desmarest, Consid. gén. sur la Classe des Crustacés, p. 259.
1825. *Phrosina semilunata*, Guérin, Encycl. Méth., t. x., Art. Uroptère.
1826. „ „ Risso, Hist. Nat. de l'Europe Mérid., t. v. p. 91, pl. iii. figs. 10–12.
1829. *Dactylocera semilunata*, Latreille, Le Règne Animal, t. iv. p. 117.
1830. „ *Nicæensis*, Milne-Edwards, Ann. des Sci. Nat., t. xx. p. 393 (extr., p. 42).
1831. „ *semilunata*, Latreille, Cours d'Entomologie, p. 400.
1838. „ *Nicæensis*, Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. *Phrosine semilunata*, O. G. Costa and A. Costa, Catal. de' Crost. del Regno di Napolo.
18—. „ „ Costa, Fauna Nap., tav. iv., fig. 1–5.
1840. *Dactylocera nicoensis* (in the index *Niciensis*), Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 238.
184–. „ *Nicæensis*, Milne-Edwards, Le Règne Animal, Illustrated Edition, pl. lviii. fig. 2.
1840. *Phrosina Nicetensis*, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 91, pl. xxx. fig. 21.
1851. *Phrosine semilunata*, Costa, in Hope's Catalogo dei Crost. Italiani, p. 21.
1853. „ „ Costa, Fauna del Regno di Napoli.
1858–74. „ *Nicetensis*, Chenu and Desmarest, L'Encycl. d'Hist. Nat., Crustacés, p. 49.
1862. „ *semilunata*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 319, pl. li. fig. 5.
1862. „ *Nicetensis*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 320, pl. li. fig. 6.
1885. „ *nicetensis*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 422.
1885. „ *semilunata*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 423.
1886. „ *Nicæensis*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. Taf. xxxiii. fig. 5.
1887. „ *seminulata* [*semilunata*], Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 27.
1887. „ *Nicetensis*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 28.

The large head deeper than long, produced at the top of the front into two little acute horns; the first two segments of the peræon coalesced; the first segment of the

pleon having the postero-lateral angles somewhat squared, the second having them more acute, the third having a very convex lower margin curving up to an acute apex, between which and a less produced dorso-lateral tooth on either side there is a sharp re-entering angle; the fourth segment is longer than the coalesced fifth and sixth, and its hind margin forms an obtuse angle at the centre. Viewed from the front the detached head has a balloon-like appearance, the mouth organs representing the narrow lower end.

The Eyes cover most of the head, leaving free a small space near the horns, and a narrow lateral tract dividing the upper from the lower group of ocelli, except along the back of the head; the ocelli of the upper group are the larger.

Upper Antennæ.—Under pressure the horns of the specimen have assumed a jointed appearance, from accidental folding of the skin; some such appearance as this may have led Milne-Edwards to suggest that these horns represented the upper antennæ. There can, however, be no doubt that Mr. Spence Bate is right in regarding as the upper antennæ the organs placed just behind and below the horns; these, in our specimen, have two free joints, the first not longer than broad, the second conical, a little bent, twice as long as its greatest breadth, with ten or twelve cylinders spreading out from the inner side and the apex. In a male specimen, taken off Malta by Dr. Bruce, the horns are not acute; the first joint of the peduncle of the upper antennæ is tumid, the two following joints much narrower than the first and not so long as broad; the first joint of the flagellum is fringed with filaments on the lower margin and apex, being produced beyond the short second joint; the third joint is longer than the second, and as long as the upper margin of the first; there are eighteen other joints, several of the upper ones being distally widened, while the lower are filiform; the ends of the antennæ being broken, the full number of joints was not ascertained.

Lower Antennæ.—These are wanting in the female. In the male specimen from Malta the lower antennæ are present, projecting from the lower part of the front of the head, therefore at some distance below the upper pair; the peduncle is not very stout; of the three free joints the third is nearly as long as the two preceding together; the filiform flagellum has thirty-three joints, of which the first is the stoutest, though itself abruptly narrower than the peduncle; the joints at the middle of the flagellum are the longest.

Upper Lip very small, distally narrowed, with a rather wide emargination, one of the lobes thus formed appearing to be minutely (perhaps accidentally) bifid.

Mandibles rather long and narrow, the cutting-edge nearly straight, striated, and very finely denticulate, with a prominent tooth at each corner; there is a spine-row of several very small spines and a long molar tubercle the crown of which is covered with a brush of numerous small spines. Neither in the specimen here described nor in the male specimen from Malta was there a mandibular palp.

Under Lip.—The principal lobes ciliated, the mandibular processes smooth, connected with the other lobes by a very convex outer margin.

First Maxillæ.—Inner plate seemingly wanting; the outer plate narrows distally, carrying its three strongest spines on the apex, with six or seven slighter ones along the inner margin, the series being continued by hair-like spines in pairs or singly at four or five points; the one-jointed palp reaches over the apex of the plate, its distal margin carrying five little teeth, and the inner margin being also to some extent denticulate.

Second Maxillæ.—The inner plate is much shorter than the outer; it has a small spine at the apex with a spinule beside it on the outer side, and some cilia along the inner margin; the outer plate has a spine at the apex, one on the inner margin a little below the apex, and cilia or setules along both margins.

Maxillipeds.—The outer plates are very narrow, slightly curved in a lateral view, closely adjoining one another from base to apex; tapering, though not to a sharp point; the apex has a group of three spinules, and there are a few spinules at distant intervals on the margins; there are also some setules longer than the spinules; the short inner plate projects inwards a little beyond the base of the outer plates, and has a group of spinules on its rounded apex, the inner margin in a lateral view being very concave.

First Gnathopods.—Side-plates not distinct from the segment, the lower front angle directed a little forward, more or less acute. The limb short, just half the length of the second peræopods, less than a third of the third peræopods; the first joint almost clear of the side-plate, rather longer than the remaining joints united, widening a little distally, ornamented with stellate or dendritic markings; the second joint short, as broad as long; the third scarcely longer than the second, apically acute, lying almost entirely upon the wrist, with some hair-like setules projecting upon the hind margin; the wrist cylindrical, widening distally, the hand also cylindrical, having its margins continuous with those of the wrist, longer than the wrist, very much narrowed distally, forming with its short slender finger a pencil-point ending. Gland-cells were not observed in the first joint, but as the muscles of that joint are relegated, as in the second gnathopods, to a narrow space in the hinder distal half, it may be assumed that the large vacuum thus left is intended for gland-cells.

Second Gnathopods.—Branchial vesicle nearly as long as and rather broader than the first joint, with accessory inflations, one longitudinal starting from the base, the others transverse. The limb very similar to that of the first gnathopods, but with all the joints longer; the first joint widest at the centre, with gland-cells along the whole course; the second joint twice as long as broad, and as long as the third joint; the wrist and hand longer, but more slender, than those of the preceding pair; the finger more elongate, with some extremely minute hairs visible on one edge.

First Peræopods.—The side-plates small, produced at the lower part of the front into a rounded lobe. The branchial vesicles of these and the three following pairs of peræopods of very irregular and complex form, supplying a very large aerating surface.

The first joint free from the side-plate, widening a little distally, but with the proximal part very narrow, producing a sort of flask-shape with the neck a little bent; the second joint longer than the third, the front apex, where the joint is widest, being at some distance from the following joint, except when that is bent upwards; the third joint as broad as long, the base much narrower than the somewhat squared distal end; the wrist attaining a much greater breadth than any of the other joints, the distal breadth about equalling the length, the front margin convex, the hinder strongly sinuous, the distal denticulate, with six little teeth and a large hind one with a small one at its base; the hand and finger are in shape and function like the finger and nail of the gnathopods in many Amphipoda Gammarina; the hand matches the length of the distal margin of the wrist, upon which it closes; its front margin is convex, the hinder nearly straight; the finger is slender, slightly curved, about a fourth of the length of the hand, and when the hand is closed, the finger crosses the projecting apical tooth of the wrist.

Second Peræopods.—The side-plates more squared than the preceding pair, the rounded lobe being at the top of the front and directed more upwards than outwards. The limb is similar in shape to that of the first peræopods, but larger; the hinder apex of the third joint is much more sharply outdrawn, so that the distal breadth of this joint is greater than its length; the distal teeth of the wrist are much more pronounced, varying greatly in size; the length of the finger does not seem to be increased in proportion to that of the hand, and, though socketed, it is perhaps not movably jointed.

Third Peræopods.—Side-plates not large, broader than deep. The first joint expanded but not greatly, about twice as long as broad, the front margin rather more convex than the hind one, with shallow sparse serration and a small acute apex; the hind margin not reaching so far down as the front one, some serration faintly perceptible on the distal half; the second joint short, triangular, the front and the two hind margins straight, with acute apices, the two lower margins sinuous; the third joint widening distally, the hind margin longer than the front, the front apex and the hinder one acute, decurrent; the fourth joint large, the convex hind margin with an acute decurrent apex, besides which the broad distal margin has six pronounced teeth, the front one very large followed by a smaller, two very large, two smaller, connected with the apex by a rounded angle, within which the fifth joint hinges; the fifth joint, which here acts as finger, is much longer than any of the other joints, and is sabre-like, acute, apparently with the sixth joint entirely absorbed or absent.

Fourth Peræopods.—Side-plates small. Branchial vesicles very complex. Limb very like that of the third peræopods, but much smaller; the first joint as long, but much narrower, with the front margin less convex than the hinder; the third joint has the front process more produced than the hinder one, the joint being altogether as long as the

following joint though not so broad; the fourth joint also differs from that of the preceding pair as well by its much smaller size as by having four teeth instead of six, graduated in size, the outermost being the longest; the finger-formed hand is not so long as the first joint, and has a pectination on the surface near and parallel with its concave front margin; the finger is here distinct, though very small, its concave front margin not continuous with that of the fifth joint. The produced front apex of the third joint in this limb seems to have suggested the name *longispina*, which Mr. Spence Bate has given to a species of *Phrosina*, but the character is shown in Milne-Edwards' figure of *Phrosina nicæensis*, and is found in all the Challenger specimens of the genus, although the process does not quite attain to the length shown in the figure of *Phrosina longispina*; as the process not uncommonly lies against the fourth joint, it easily may be, and no doubt often has been, overlooked.

Fifth Peræopods.—The side-plates with sinuous front and lower margins at right angles, connected by a very convex hind margin; the limb reduced to a simple membranous plate, the front margin slightly convex, with a minutely pointed apex, the hind margin almost semicircular but widening out at the two ends. I can perceive no trace of a second joint, other than a little semicircular mark which scarcely reaches the small cavity between the apex of the front margin and the bend of the hind margin to meet it.

Pleopods.—The two coupling-spines very small with the usual inverted saucer-like head, and having a lateral saw of four teeth, certainly on one, probably on either edge; the cleft spine with stout shaft, the two arms slender, short, equal in length; the joints of the rami ten to eleven, the first joint in each narrow at the base, then widening; the first joint of the outer ramus having the not uncommon twisted connecting process descending from the peduncle and directing its narrow apex towards the inner ramus.

Uropods.—The two long distally rounded plates of the first pair are slightly longer than, and not so broad as, those of the third pair, with minutely pectinate edges; the two plates of the second pair are shorter than either those of the first or third. All the six plates more or less overlap, their broadly rounded ends being of great tenuity, and often showing prismatic colours; they are diversified by irregular markings, the third pair having stellate markings on the lower part.

The Telson, a little longer than broad, about two-sevenths of the length of the third uropods, a half-oval, difficult to distinguish, owing to its thinness, divided by a very fine line from the preceding segment of the pleon.

Length.—The specimen, in the position figured, measured in a straight line rather more than one-fifth of an inch.

Locality.—The specimen here described was obtained in the North Atlantic, from the surface, at night, April 29, 1876; lat. 18° 8′ N., long. 30° 5′ W.; surface temperature, 73°·7. Another was taken in the North Atlantic, June 18–19, 1873; lat. 35° 18′ N., long. 51° 42′ W., also at the surface; surface temperature, 71°.

Remarks.—There can, I think, be no reasonable doubt that *Phrosina semilunata*, Risso, and *Phrosina nicæensis*, Milne-Edwards, are the same species; as specimens are recorded an inch in length, the species evidently attains a much greater size than shown by the Challenger specimens, but unless it be in the greater or less development of the dorsal and lateral angles of some of the pleon segments, there seems to be very little variation between very small and very large examples.

Phrosina pacifica, n. sp.

This species has so great a resemblance to that which I have already described as *Phrosina semilunata*, Risso, that it is unnecessary to do more than note the points of difference.

The skin appears to be studded with numerous minute hairs. The *Antennæ* end acutely, having a small linear terminal joint, the preceding large joint being apically produced a little way alongside of it.

The first joint of the *First Gnathopod* exhibits no dendritic markings.

In the *Second Peræopods*, the finger-formed fifth joint ends acutely, without the least trace of a separate finger.

The first joint of the *Third Peræopods* is much expanded, so that the joint is not nearly twice as long as broad, with the greatest breadth a little above the centre; the fourth joint, between the apical tooth of the hind margin and the other six acute distal teeth, has a blunt tooth adjoining the hinge of the following joint.

In the *Fourth Peræopods* the fourth joint has five distal teeth instead of only four, besides the apical tooth of the hind margin; the terminal finger is extremely minute, scarcely distinct, except that its front margin is not quite continuous, and its somewhat longer hind margin by no means continuous, with that of the fifth joint.

The Fifth Peræopods have a tiny triangular second joint, with blunted tip.

The rami of the *Pleopods* have fifteen joints.

The Uropods appear in all the pairs to have microscopically pectinate edges, but this may be the case also in the other species; there are no stellate markings to break the glassy clearness of the terminal portions; the third pair are rather broader, and end more squarely, though with rounded corners; the second pair are a little broader and not very much shorter than the first.

The Telson is a little broader than long.

Localities.—April 3, 1875, North Pacific, south of Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. One specimen.

Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. One specimen.

Phrosina australis, n. sp.

The only differences of importance that I can discover between this species and *Phrosina semilunata*, Risso, refer to the uropods, of which the first and second pairs, instead of having broadly rounded terminations, are distinctly narrowed and acute or nearly so; the telson also is less rounded apically than in the other species; the rami of the pleopods have seven or eight joints. The fourth segment of the pleon has the hind margin straight across the back. In the first and second peræopods, the denticulation of the distal margin is less marked than in the other species, and in the fourth peræopods this margin has three teeth in the front part, that nearest the fifth joint being the broadest of the three.

Length, rather under a quarter of an inch.

Locality.—Station 164D, June 14, 1874; east of Australia; lat. 34° 3′ S., long. 152° 20′ E.; surface; surface temperature, 67°·5. One specimen.

Remarks.—The specific name refers to the capture of the species far in the south. The difference in the uropods is rather striking as combined with the very close resemblance in other parts between this and the type species.

The following list will show the distribution of the genus *Phrosina* as illustrated by the Challenger specimens:—

1. June 18–19, 1873, east of Bermuda; lat. 35° 18 N., long. 51° 42′ W.; surface. One specimen.

2. April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night. One specimen.

3. Station 346, April 6, 1876; Tropical Atlantic; lat. 2° 42′ S., long. 14° 41′ W.; surface. One specimen.

4. Station 164D, June 14, 1874; east of Australia; lat. 34° 3′ S., long. 152° 20′ E.; surface. One specimen.

5. Station 201, October 26, 1874; off Samboangan; lat. 7° 3′ N., long. 121° 48′ E. One specimen, a fifth of an inch long, mounted in Canada balsam.

6. April 3, 1875, North Pacific, south of Japan; lat. 24° 49′ N., long. 138° 34′ E. One specimen.

7. Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface. Four specimens.

This range is extended by specimens which have been reported from the Mediterranean and the Cape of Good Hope, and by *Phrosina longispina*, Spence Bate, "found in the stomach of a shark, lat. 26° 27′ S., long. 90° W." It is probably under some misapprehension that Bovallius assigns the last-named species to the "South Atlantic."

Genus *Anchylomera*, Milne-Edwards, 1830.

1830. *Anchylomera*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 394 (extr., pp. 34, 43).
1836. *Hieraconyx*, Guérin, Magasin de Zoologie, Classe vii. p. 4.
1837. *Anchylomera*, Burmeister, Handbuch der Naturgeschichte, Abth. ii.
1838. *Hieraconyx*, Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.
1838. *Anchylomera*, Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.
1840. „ Milne-Edwards, Hist. nat. des Crustacés, t. iii. p. 85.
1840. *Hieraconyx*, Lucas, Hist. nat. des Crust., Arachn. et Myriap., p. 237.
1840. *Anchylomera*, Lucas, Hist. nat. des Crust., Arachn. et Myriap., p. 238.
1850. *Cheiropristis*, de Natale, Crost. del porto di Messina.
1851. „ Costa, in Hope's Catalogo dei Crost. Italiani, p. 21.
1852. *Anchylomera*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1001, 1442.
1858–74. „ Chenu and Desmarest, L'Encycl. d'Hist. Nat. Crust., p. 49.
1858–74. *Hieraconyx*, Chenu and Desmarest, L'Encycl. d'Hist. Nat. Crust., p. 49.
1862. *Anchylomera*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 322.
1867. *Cheiropristis*, Costa, Saggio della coll. de' Crost. Medit. Mus. Nap.
1874. *Anchylomera*, Hoffmann, Recherches sur la Faune de Madagascar, etc., partie 5, livr. 2.
1875. „ Schiødte, Naturh. Tidsskr., R. 3, Bd. 10, p. 229.
1879. „ Claus, Der Organismus der Phronimiden, p. 3.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 423.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 487.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 26.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 571.

For the original definition of the genus, see Note on Milne-Edwards, 1830 (p. 143). For the definition of *Hieraconyx*, see Note on Guérin, 1836 (p. 164). For the account of *Cheiropristis*, see Note on de Natale, 1850 (pp. 236–239). At page 239 I have accepted Spence Bate's suggestion that de Natale's "*Cheiropristis Messanensis*" belongs to the genus *Anchylomera*, but it should be noticed that the figure given in the Brit. Mus. Catal. Amph. Crust., pl. lii. fig. 4, with the name *Anchylomera sedentaria*, and a reference to "Phronima sedentaria, *Costa, Pochi Crust. del Messina*," has nothing to do with *Cheiropristis messanensis;* it is in fact a reproduction of the "*Phronima Coccoi*" figured in de Natale's Lettera[1] al Sig. Achille Costa, Su pochi Crostacei del porto di Messina, and represents a true *Phronima* of the male sex.

To the definition of the family Bovallius in 1887 adds only a few words for the definition of the genus, as follows:—

"The first two pairs of pereiopoda [*First and Second Gnathopods*] simple, the third, fourth, and fifth pairs [*First, Second, and Third Peræopods*] subcheliform. The uropoda are rounded behind."

To these characters it may be added that the female is distinguished from the male

[1] See Appendix, Note on de Natale, 1850 (pp. 1621–1624).

by the absence of the mandibular palp, by the reduction of the upper antennæ to a minute rudiment, by the absence of the lower antennæ, and by the loss of the terminal joints of the fifth peræopods.

Anchylomera, blossevillii, Milne-Edwards (Pl. CLXXVII.).

1830. *Anchylomera Blossevillii*, Milne-Edwards, Ann. des Sci. Nat., t. xx. p. 394 (extr., p. 43).
1830. „ *Hunterii*, Milne-Edwards, Ann. des Sci. Nat., t. xx. p. 394 (extr., p. 43).
1836. *Hieraconyx abbreviatus*, ♂, Guérin, Magasin de Zoologie, Classe vii. p. 5, pl. xvii. figs. 2, 2*a*–2*f*.
1838. „ „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1838. *Anchylomera Blossevillii*, Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1838. „ *Hunterii*, Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. *Hieraconyx abbreviatus*, Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 237, pl. xviii. fig. 4.
1840. *Anchylomera Blossevillii*, Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 238.
1840. „ *Blossevilleii*, ♂, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 87.
1840. „ *Hunterii*, ♂, Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 88, pl. xxx. fig. 4.
1850. *Cheiropristis Messanensis*, ♂, de Natale, Crost. del porto di Messina, tav. i. fig. 2.
1852. *Anchylomera purpurea*, ♂, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 1001, pl. lxviii. figs. 9*a*–*m*.
1852. „ *thyropoda*, ♀, Dana, U.S. Explor. Exped. vol. xiii. pt. ii. p. 1004, pl. lxviii. figs. 10*a*–*g*.
1862. „ *antipodes*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 322, pl. li. figs. 9, 10.
1862. „ *Blossevillei*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 323, pl. lii. fig. 1.
1862. „ *Hunteri*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 324, pl. lii. fig. 2.
1862. „ *abbreviata*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 324, pl. lii. fig. 3.
1862. „ *purpurea*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 325, pl. lii. fig. 5.
1862. „ *thyropoda*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 325, pl. lii. fig. 6.
1884. „ (*Hieraconyx*) *abbreviatus*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. Taf. xxxv. figs. 4, 4*a*, 4*b*.
1887. „ *abbreviata*, Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 571.
1887. „ *antipodes*, Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 572.

The head wider and deeper than long, the front having its lower margin at the centre produced downwards in a narrow triangle over the small triangular group of the mouth organs; first and second segments of the peræon dorsally coalesced, the composite segment being longer than the third or fourth, the first at the sides descending below and entirely clear of the second; the fifth segment longer below than any of the other peræon-segments; the first three segments of the pleon large, with the postero-lateral angles rounded; the fourth segment with a transverse dorsal depression; the fifth and sixth segments coalesced, the composite segment short. The heart strongly walled, with three pairs of venous ostia.

The Eyes occupying all the surface of the large head except a small triangular space on the top at the centre of the hind margin and the slightly depressed tract down the front which in the male is occupied by the antennæ.

Upper Antennæ of the male planted in the frontal cavity, which does not reach the top of the head. The three joints of the peduncle very short and closely combined, the first the longest and a little inflated; the first joint of the flagellum directed upwards so as to form an angle with the peduncle,[1] which it exceeds in length, on the lower side produced into a pointed process under the first two or three or four short succeeding joints, the whole under side of the joint and both sides of the process furnished with a close brush of filaments set in transverse rows; the joints after the first abruptly narrower, the second to the fifth short, the rest rather elongate; these delicate flagella were broken in almost all the specimens; in one specimen twenty-one joints were counted; each joint, the first three excepted, has on the under side two little prominences, from which depend small groups of filaments. In the female the upper antennæ are represented only by a pair of minute tubercles.

Lower Antennæ of the male inserted immediately below the upper. The peduncle with three free joints, the first having a very convex upper margin, the second shorter, scarcely longer than broad, the third longer than the first, slightly bent upwards and having its lower margin much more convex than the upper; the flagellum abruptly narrower than the peduncle, the first joint a little knobbed at the base as if to form a ball and socket joint with the end of the peduncle; the general structure of the flagellum as in the upper antennæ, but with no very short joints at the base, the joints in general longer, with three instead of two groups of filaments on the under side; in one specimen there were twelve joints remaining, but many may have been missing. Milne-Edwards assigns forty joints to the flagellum of the upper antennæ, and more than fifty to that of the lower in his description of "*Anchylomera Blossevilleii.*" The figures *a.s.A.*, and *a.i.A.*, were not drawn from the same specimen as the full figure and the other separate parts.

Mandibles.—The cutting edge very slightly convex, striated, having a tooth at the upper end curving downwards and another at the lower end curving a little upwards; the secondary plate on the left mandible has its edge more or less dentate, and approaches much nearer the edge of the primary below than above; on the lower margin of the mandible, behind the lower tooth of the cutting plate, there is a bush of spine-like bristles; the molar tubercle, much broader than deep, has its crown set round with spinules, the outer margin, which is next the trunk of the mandible and nearly parallel with the cutting edge, being crenulate; the palp placed behind the molar tubercle, at about the centre of the mandible, has the first joint large, much broader than either of the following,

[1] Milne-Edwards says of the antennæ "les inférieures coudées," but the "elbow" is more pronounced between the peduncle and flagellum of the upper antennæ, than between the joints of the peduncle of the lower.

and not very much shorter than the two together; the third joint is thinner than the second, very little shorter, with a narrow curved tip; the hind margin of each joint is convex; the second forms an angle with the first by bending backwards, the third with the second by bending forwards.

Lower Lip.—The principal lobes broad, well ciliated, dehiscent, the connecting band having a scabrous ridge at the centre on the inner surface; the mandibular processes rather broad.

First Maxillæ.—The outer plate has a row of setules or very thin spines on the inner margin, which are followed by seven spines along the obliquely sinuous apical margin, the three on the actual apex being much stouter than the rest; a second row of setules is planted on the surface at a little distance from the spines; the one-jointed palp is narrower than the plate but reaches a little beyond it; it has five little apical spines, one or two on the lateral margin, and setules on the outer margin.

Second Maxillæ.—Both plates tapering, tipped with small spines and fringed with setules; the outer plate the longer.

Maxillipeds.—A narrow stem rising from a broad base carries a pair of slender outer plates, set close together, tapering, fringed on or near the outer margin with hair-like spinules, and having a little tooth on the inner margin near the apex; the inner plate is rather more than half as long as the outer, set with hair-like spinules; its apex rounded, the plate itself springing unjointed from the strongly curved central ridge of the stem. The figure *mxp.B.*, representing the outer surface, is taken from a female specimen.

First Gnathopods.—Side-plates not distinct from the segment. The first joint of these diminutive limbs is as long as the remaining joints united, adapted for gland-cells, the front margin convex, carrying some minute setules, the hind margin sinuous; the second joint quite short; the third joint not much longer, apically acute, most of it lying on the inner side of the wrist; the wrist shorter than the hand, widening distally, fringed on and about one margin with short spinules, the other slightly furry; the hand near the base about as wide as the wrist, with convex margins, the distal half tapering, the margins fringed with spinules or setules, of which there is a third row on a ridge of the hand's inner surface; the finger not half the length of the hand, socketed in the apex of the hand and bending over in the specimen figured, so as to be scarcely visible. Milne-Edwards was only able to distinguish four joints in these and the following gnathopods, "the first long and cylindrical, the two following very short, and the last large, flattened, lanceolate, ending in a very sharp point."

Second Gnathopods.—The branchial vesicles longer and much broader than the first joint of the limb, having like the following pairs several subsidiary folds or pockets down the centre. The side-plates not distinct from the segment, covered with scale-like markings; the segment above each side-plate sending out a strong interlocking process

from the hind margin. The first joint is longer and broader than that of the first gnathopods, by which it is overlapped above; the front margin convex, the hinder sinuous, the interior of the joint containing a long oval pocket of gland-cells; the second, third, and fourth joints similar to those of the preceding pair, but thinner; the hand much longer, thinner at the base, from which it tapers to nearly the middle, in a somewhat oval form, fringed with spinules or setules, the remainder being drawn out into a long, slender, nearly straight process, with parallel sides, the minute finger being socketed in the apex as in the preceding pair, minutely scabrous on its inner surface.

First Peræopods.—Side-plates distinct, much broader than deep, shallow, axe-like, but with the ends rounded. The branchial vesicles sack-like, much longer than the first joint, with some nine subsidiary pockets. The limb much longer than the gnathopods; the first joint with a bent neck, the distal half wider than the proximal; the second joint considerably longer than broad, channelled in front; the third not quite so long as the second, widening at once from the narrow neck, so that without the neck the width is fully as great as the length, the hind margin finely pectinate; the fourth joint not so long as the first joint, but broader, with scabrous surface; the front margin smooth, gently convex; the hind margin forming with the emarginate distal border (where the joint is widest) a triangular process, both these margins being pectinate, and the hind margin having also a small tooth or projection at two or three points, attended by spinules, of which there are several submarginal on the lower part of the joint; the fifth joint a little shorter than the fourth, much thinner, folding across the distal margin of the fourth joint as though it were a finger to it, and in this position extending much beyond it; the hinder margin pectinate, the front gently convex, furred, the fur extending over much of the surface; the finger slender, slightly curved, more than half the length of the fifth joint, pectinate for two-thirds of the hind margin.

Second Peræopods differing very slightly from the first, except that the fourth joint is rather narrower at the base, has a more regular hind margin, and distally forms a triangular process which is considerably longer than that in the preceding pair, so that the fifth joint, although rather longer than in the first peræopods, does not extend so much beyond the fourth joint as in that pair. In both pairs the expanded fourth joint contains gland-cells.

Third Peræopods massive. The side-plates larger than in the preceding pairs, if not in proportion to the increased size of the joint; the process on the inner surface is broad, with sinuous lower margin. The first joint of great breadth; the front margin formed by an oblique line descending to the point of greatest breadth, and below this by a strongly sinuous line, at first concave and then convex; the hind margin has an upper rounded lobe and is then gently sinuous; there is a ridge down the centre of the inner urface, with a small lobe at each extremity; the second joint a little longer than broad,

channelled behind, with the nearly straight front margin ending in a pointed apex, the hind margins strongly convex, that of the inner surface the more extensive; the third joint much broader than long, short, cup-like to receive the fourth joint, the hinder apex produced; the fourth joint having its convex hind margin smoothly continuous with that of the preceding joint, the front margin shorter, nearly straight, the distal margin of great breadth, cut into six or seven graduated teeth, the foremost the largest, the two next the hinge minute; the narrow, slightly curved, fifth joint tapers a little, and closes down upon the teeth just mentioned, reaching a very little beyond them (or in some specimens not beyond them), and in combination with these forming a powerful clasper; the finger is slender, tapering, nearly straight, not half the length of the hand. There are some minute spinules on the limb, chiefly on the front margin of the fifth and on the teeth of the fourth joint.

Fourth Peræopods much slighter in structure though not much shorter than the third. Side-plates small and shallow. First joint nearly as long as that of the preceding pair, which it resembles, widest just below the neck, much narrowed lower down, the front margin very sinuous, pectinate below, a narrow lobe at the apex partly overlapping the next joint, the hinder margin below the upper expansion nearly straight; the second joint short, channelled before and behind; the third joint not longer than the second, a little broader than long, pectinate in front, the hind margin convex, the inner surface scabrous; the fourth joint oval, longer than the second and third together, narrower at the distal end, the front margin a little unevenly convex, finely pectinate, the inner surface strongly scabrous down the centre; the fifth joint narrow, scarcely shorter than the fourth, pectinate in front, furred behind, the hind margin with a little more convexity than the front; the finger slender, slightly curved, more than half the length of the fifth joint, two-thirds of the inner margin pectinate.

Fifth Peræopods.—The side-plates not distinct from the segment, which, it may be mentioned, displays on either side when flattened out a singularly sinuous margin both behind and before. The first joint attains its greatest width immediately below the point of attachment, and thence narrows gradually to the distal end, with a straight hind margin and slightly concave front one, the length being a little less than that of the first joint in the preceding pair; there are numerous conspicuous gland-cells along the centre; the remaining joints are feeble, together not nearly as long as the first, against which, along the protecting ridge of its inner surface, they are commonly folded back; the second joint short, lying across and within the rounded and three-lobed apex of the first joint; the third longer, oval; the fourth narrower than the third, but much longer; the fifth narrower than the fourth, shorter than the third, bent; the finger little more than half the length of the fifth joint, not pointed, but a narrow oval, the distal end serrated with some minute retroverted teeth. In the female the first joint is similar to that in the male, or with the hinder lobe of the apex a little more produced down-

wards; to the central piece of the apex there is attached a stump of the second joint, which completes the limb in this sex.

Pleopods.—Peduncles stout, squared or oblong, with the lower margin lobed on either side, and sending out a small hammer-headed process over the outer ramus; the two coupling spines are small, but elaborately spined, the heads being smooth domes with zigzag edges, and a set of three retroverted teeth projecting from each margin of the shaft; the single cleft spine is not very elongate, with a rather broad, strongly ciliated stem, the arms rather short and thin, the longer roughened on two margins, the shorter having the subapical dilatation; the outer ramus has eleven, the inner ten joints; the first joint in each ramus being broad, but not very long, the rami themselves broad, not tapering rapidly.

Uropods all extremely transparent, except in the upper part, where they show hexagonal cell markings, visible also in other parts of the animal; the ends of all are rounded, sometimes more flatly in the first and third pairs than in the second, and all have a marginal ciliation of extreme fineness, most easily observed at the distal ends, and perhaps absent from the upper parts; there do not appear to be any peduncles[1] distinct from the supporting segments; all the pairs have a shape in general oval, but with a constriction on the inner side near the base; the first pair reach as far as the third, and are therefore longer than the third, but a little less broad; the second pair attached at the top of the double-segment, are less broad than the first and shorter than the third; the third pair attached at the lower end of the double-segment, bend inwards, so that one plate lies upon the other for most of its length.

Telson rather broader than long, about half the length of the third uropods, in shape an inverted arch, with the apex broadly rounded.

Length.—The specimen, in the position figured, measured a quarter of an inch, in a straight line from the front of the head to the end of the third segment of the pleon.

Locality.—April 4, 1875; North Pacific, south of Japan; lat. 25° 33′ N., long. 137° 57′ E.; surface; surface temperature, 69°.

Remarks.—In the young taken out of the mother, and less than a twentieth of an inch long, the general shape and proportions of the adult are already seen, the fourth joint is distally widened in the first four pairs of peræopods, but the fifth joint is comparatively broader; the pleopods have as usual in the young two-jointed rami, the second joint much shorter than the first.

The name "*Anchylomera Blossevillii*," Milne-Edwards, afterwards written "*Anchylomera Blossevilleii*," will probably cover all the species named in the synonymy, since

[1] Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 87, says that these uropods "sont réduites en un petit article basilaire à peine perceptible, auquel est attachée une grande lame ovalaire de consistance membraneuse." Bovallius regards the membranous plates as themselves the peduncles. Whether they are in fact the peduncles without rami, or the rami without peduncles, or the rami and peduncles combined, cannot at present be decided, but there is perhaps as much to be said for the third view as for either the first or the second.

none of the distinctions given, which can be depended upon, seem to be of specific value. For example, in "*Anchylomera Hunterii*," Milne-Edwards, the flagellum of the upper antennæ has "only about fifteen joints," but in *Anchylomera*, as in some other genera of the Hyperina, the flagella of the male antennæ go through many changes of length and thickness, being shorter and thicker in an intermediate stage than they are in their final development. In regard to *Anchylomera antipodes*, Spence Bate, we read in the description of the female, "fifth pair of pereiopoda consisting of the basos only, which is longer than broad," while in the description of the male it is said that all the peræopods are practically the same as in the female; but this general observation rather implies that the peræopods of the male had not been specially examined. In *Anchylomera purpurea*, Dana,[1] which is figured with the antennæ of an adult male, the fifth peræopods are like those here described, except that Dana has probably overlooked the small and obscure second joint; in *Anchylomera thyropoda*, on the other hand, of which the antennæ are "very short without a flagellum," Dana says that the fifth peræopods are "obsolete excepting coxa." The Challenger specimens, alike from the Atlantic and the Pacific, show that in the male the fifth peræopods have the full number of joints, but that in the female the number is curtailed. The ciliation of the uropods varies in different specimens, being liable, I am inclined to think, to removal by various accidents. So far, then, as all the characters are concerned, which have been hitherto used for specific distinctions within this genus, it may be said that, where they are not beyond doubt merely sexual, they are probably either due to the particular age of the individual specimen or to accident.

The following list of Stations shows the distribution of the genus *Anchylomera* as illustrated by the specimens in the Challenger collection :—

1. North Atlantic, between Tenerife and St. Thomas, West Indies. Five specimens, three male, two female.

2. Station 348, April 9, 1876; Equatorial Atlantic; lat. 3° 10′ N., long. 14° 51′ W.; surface to 200 fathoms; surface temperature, 84°. One specimen, male.

3. Station 347, April 7, 1876; Equatorial Atlantic; lat. 0° 15′ S., long. 14° 25′ W.; surface; surface temperature, 82°. One specimen, male. The antennæ were complete in this specimen, the flagellum in each pair consisting of thirty-four joints.

4. June 8, 1874, off Port Jackson; surface, night; surface temperature, 67°. One specimen.

5. South Pacific, between Sydney and Wellington; surface. One specimen, male.

6. June 15, 1874, between Sydney and Wellington; lat. 34° 6′ S., long. 155° 12′ E.; surface; surface temperature, 62°·7. Three specimens.

[1] In the Brit. Mus. Catal. Amph. Crust., pl. lii., the gnathopods and second peræopod of *Anchylomera purpurea* have been accidentally numbered as though they belonged to *Platyscelus rissoinæ*.

7. Station 165, June 17, 1874; between Sydney and Wellington; lat. 34° 50′ S., long. 155° 28′ E.; surface; surface temperature, 64°·5. Four specimens.

8. South Pacific, between Api and Cape York; surface. One specimen, female.

9. April 3, 1875, North Pacific, south of Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. Specimens numerous; also one specimen, female.

10. April 4, 1875, North Pacific, south of Japan; lat. 25° 33′ N., long. 137° 57′ E.; surface; surface temperature, 69°. Specimens numerous.

11. Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. Four specimens.

12. Between Papua and Japan, surface. One specimen.

13. July 1875, between Japan and Honolulu. Two specimens.

14. July 1875, between Japan and Honolulu; lat. 35° N.; surface. Three specimens.

To complete the known range of the genus we must add to the above-mentioned localities Milne-Edwards' specimens from the Indian Ocean and the Isle of Bourbon, Guérin's from between the Falkland Isles and Port Jackson, Spence Bate's *Anchylomera antipodes*, lat. 58° S., long. 172° W., Dana's species respectively from lat. 27° S., long. 45° 10′ W., and lat. 39° S., long. 54° W., and the Mediterranean species "*Cheiropristis Messanensis*." All the localities together show that the genus is distributed round the world, and since it reaches lat. 58° in the south, it is possible that it may eventually be found to extend beyond lat. 40° N., which is about as far as our present information carries it.

Genus *Primno*, Guérin-Méneville, 1836.

1836. *Primno*, Guérin, Magasin de Zoologie, Classe vii. p. 2.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 239.
1840. „ Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 81.
1847. „ White, List of Crustacea in Brit. Mus., p. 91.
1849. „ Nicolet, Hist. fis. y pol. de Chile por Claudio Gay, Zool., t. iii.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1442.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 321.
1879. „ Claus, Der Organismus der Phronimiden, p. 3.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 488.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 28.

For the original definition of the genus, see Note on Guérin, 1836 (p. 164).

Primno macropa, Guérin (Pl. CLXXVIII.).

1836. *Primno macropa*, Guérin, Magasin de Zoologie, t. vi. Classe vii. p. 4, pl. xvii. figs. 1*a*–1*f*.
1838. „ „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ „ Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 239, pl. xviii. fig. 7.
1840. „ „ Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 81.
1849. „ *macropo*, Nicolet, Hist. fis. y pol. de Chile por Claudio Gay, Zool., t. iii.
1862. „ *macropa*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 322, pl. li. fig. 8.
1884. „ „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. Taf. xxxv. figs. 3, 3*a*.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 28.

Head irregularly globose, when detached together with the mouth organs having in a front view a sort of balloon-shape, the rostral angle above the upper antennæ rounded, folded inwards; the first segment of the peræon very narrow below, but dorsally the longest of the peræon-segments except the seventh; the seventh peræon-segment and the two first of the pleon produced backwards into sharp processes in the middle of the back; the peræon not carinate, but tending to be so, especially at the last segment; the first three segments of the pleon not very strongly carinate, the postero-lateral angles of the first two squared, of the third very acute, the fourth segment longer than the coalesced fifth and sixth.

Eyes covering most of the surface of the head, the upper and lower eye on each side of the head contiguous, but the upper having much larger ocelli than the lower.

Upper Antennæ.—The peduncle consisting of one joint, which is short and stout, cylindrical, widening distally; the flagellum also consisting of one joint, which is long, prismatic in section, tapering at first rapidly, with five short filaments on either side, beyond these becoming very narrow, and drawn out to a fine point.

Lower Antennæ wanting in the female, or only represented by a small protuberance.

Mandibles.—The cutting edge narrow, minutely striated, with a little tooth at either end; a small group of spinules adjoins the tooth of the lower end; the secondary plate of the left mandible is very small; the molar tubercle broad, its crown fringed with comparatively long teeth and set with numerous hair-like spines; behind the molar tubercle the lower edge forms a very convex lobe; there is no palp (in the female).

Lower Lip short and compact.

First Maxillæ.—The plate narrows to the distal margin, on which it carries three comparatively large spines and a smaller one at the outer corner; six small ones fringe the inner margin, having below them four or five that are almost thread-like; the one-jointed palp reaches beyond the plate, is very slightly curved, of almost even breadth

throughout, with six little spine-teeth spaced along the inner margin, perhaps as many close-set on the distal border, and five slender spines along the outer margin.

Second Maxillæ.—The outer plate narrow and tapering, beset with hairs, and having a spinule or two at the apex; the inner plate much shorter, triangular, its outer margin standing out nearly at right angles to the outer plate, the apex tipped with a spinule, the inner margin carrying some hairs.

Maxillipeds.—The inner plate inconspicuous, almost obsolete, with rounded apex; the outer plates narrow, tapering, hairy on the outer, slightly convex surface, carrying two minute spinules on the nearly acute apex, and two or three at irregular intervals along each margin.

First Gnathopods small, without any distinct side-plates. The first joint about as long as the next four joints together, with sinuous margins, the joint being narrower in the middle than above and below; the muscles do not reach to the middle of the joint, the upper space being required for gland-cells; the second joint longer than broad, bent, so that the remainder of the limb is directed forwards and a little upwards to the mouth; third joint about as long as the second, the apical point lying upon the wrist; wrist cylindrical, as long as the preceding two joints together; hand also cylindrical, narrowing distally, longer than the wrist, having some minute spines and hairs on the margin; finger when outstretched about a third the length of the hand, the margin fringed with short stiff hairs; the nail short, pointed.

Second Gnathopods larger than the first, which they tend to overlap. The side-plates triangular, sharply pointed forwards, of a shape more commonly found attached to the first than to the second gnathopods. Branchial vesicles longer than the first joint, not broader, narrow at the neck. Marsupial plates very thin and transparent, smooth-edged, rather longer than the first joint, shorter than the branchial vesicles. The first joint oval, much wider than that of the first gnathopods, the muscles occupying only a small space low down at the back, the remainder being nearly filled with the gland-cells; the remaining joints closely resemble those of the preceding pair, but are larger, the wrist both broader and longer, and a little dilated at the proximal end; the hand longer than the wrist, tapering, with a slight curve, without hairs but with a few minute spinules; the finger not a fifth the length of the hand, without any nail.

First Peræopods.—The side-plates produced in front, broader than deep, deeper behind than in front. Branchial vesicles rather longer than the first joint. The marsupial plates rather longer and broader than the branchial vesicles. The first joint narrow, widening slightly from the narrow base; the second joint longer than broad, with one spinule at the middle of the hind margin; the third longer than the second, with two spinules wide apart on the hind margin; the fourth joint almost as long as the second and third together, with four spinules on the hind margin, two of them at strong indents, a fifth spinule within the little produced apex; the fifth joint

a little longer than the fourth, the hind margin finely and obliquely pectinate, and with five hair-like spinules standing out at right angles to the margin; the finger more than one-third the length of the first joint, strongly bent at the tip.

Second Peræopods very similar to the first, but with the side-plates a little less shallow in front, the first joint less slender, the third joint larger, with the two indents of the hind margin more marked, the fourth joint also larger, equalling the length of the fifth, which is itself rather longer than in the first peræopods.

Third Peræopods.—The side-plates produced in advance of the main framework of the segment, from which they are in this and the two next pairs very indistinctly separated. Branchial vesicles broad, irregular in shape, not quite so long as the first joint. Marsupial plates narrow, longer than the first joint. The first joint entirely free from the side-plate, muscular, widening downwards, channelled behind, the hind margins nearly straight, the front slightly convex below, sparingly serrate; the second joint not longer than broad, channelled behind, with one apex squared, the front margin a little serrate; the third joint little longer than the second but much wider, the front margin oblique with a sharp apex, the lower margin sinuous; the fourth joint very large and muscular, longer than the first joint, widest near the base, not twice as long as broad, the hind margin slightly convex, with a small apical tooth, the front margin cut into fifteen oblique teeth, the first a long one with a little denticle high up on its front; this is followed by three short, a long, four short, a long, and five short teeth, of these five the middle one being the longest; between the last of these and the apical tooth of the hind margin is the curved hinge of the narrow fifth joint, which is of almost even breadth throughout, and when closing upon the hand-like fourth joint just crosses beyond the tip of its second long tooth; almost continuous with the margins of the fifth joint are those of the finger, which is long, tapering, and in its distal half much curved; it is over half the length of the fifth joint, the two together being longer than the fourth.

Fourth Peræopods.—Branchial vesicles distally very broad. The first joint not so massive but as broad and nearly as long as in the preceding pair, the greatest breadth near the middle, the hind margin forming an angle (very slightly rounded) at the top, then running in a straight course to the distal end, the front margin convex, the lower part with five indents and a little apical point; the second joint angled behind, and having one indent in front; the third joint much longer than the second, the front margin with two indents and an apical tooth, the hind margin with one or two minute indents, and a long decurrent apical tooth; the fourth joint a little longer than the third including the apical tooth, its hind margin having two minute indents and a small apical tooth, its front margin cut into six teeth, of which the first, third, and fifth are scarcely more than serration; the fifth joint as long as, or a little longer than, the fourth, slender, slightly curved, the front margin pectinate; the finger slender, about one-third the length of the fifth joint, the end much curved.

Fifth Peræopods.—The first joint as long as that of the fourth peræopods but narrower, about equal in length to the remaining joints together or a little longer, curved, narrowing a little distally, the hind margin convex and very shallowly serrate; the second joint short, bent back at right angles, not as long as the distal end of the first joint, below which it partially appears; the third joint turned upwards, rather longer than the second; the fourth straight, considerably longer but rather narrower than the second; the fifth longer and narrower than the fourth, though in one of the limbs of this pair the difference in length between these two joints was very slight; the finger considerably more than half the length of the fifth joint, with convex hind margin, the front concave to the point of greatest breadth, then straight and pectinate, the fine teeth of the comb standing at right angles to the margin, and increasing successively almost to the apex.

Pleopods.—The two coupling spines very short and small; it appears as if the teeth of the apical caps were prolonged, so that one or other looks like a lateral tooth according to the position in which the spine happens to be seen; the cleft spine is short, with stout shaft and very short arms, the arm with the subapical dilatation longer than the roughened one; the joints of the rami number from eleven to twelve; the first of the inner ramus is attached a little above the first of the outer, and is a good deal narrower at its base than distally; as usual the peduncles of the first pair are considerably longer than those of the third.

Uropods.—The first pair are longer than the second or third, reaching beyond the second, but not so far back as the third; the plate is lanceolate, attaining its greatest breadth not far from the base, being obliquely pectinate along most of the outer margin as far as the apex, and much more slightly on the lower half of the inner margin; the second pair are fully as broad as the first, and nearly as long as the third; the outer margin is much more convex than the inner, with half a dozen distant indents, and fine pectination along the lower half, the inner margin being likewise pectinate in the lower part; the third pair are much broader than the first or second, with a length more than twice the breadth; the breadth varies little except at the two extremities; the outer margin, which is slightly pectinate, and has one or two indents, ends in an acute apex, from which the pectinate distal margin runs obliquely back to the principal apex, which the pectinate inner margin reaches by a sinuous curve.

Telson small, triangular, rather broader than long, much narrower than the third uropods and little more than one-fifth of their length, the apex slightly rounded.

Length.—The specimen, in the position figured, measured three-tenths of an inch.

Locality.—Station 287, October 19, 1875; South Pacific; lat. 36° 32′ S., long. 132° 52′ W.; surface; surface temperature, 57°·8. One specimen, a female with the young far developed.

Remarks.—Guérin's account differs in making the wrist and hand of the second

gnathopods equal in length, and the postero-lateral angles of the first three pleon-segments rounded; he neither mentions nor figures the dorsal tooth of the seventh peræon-segment and the first two pleon-segments, and the telson, as he figures it, can scarcely be considered triangular; but the more striking peculiarities of his new species probably diverted his attention from features less notable, which in this genus happen to be very difficult to make out; that he divides the sixth joint of the fifth peræopods into two in the figure is obviously due to some accident.

In the young, less than one-twentieth of an inch long, the shape is not more slender than in the parent, none of the segments are dorsally produced; the upper antennæ appear to consist of one thick joint, longer than thick, and a terminal short joint; in the gnathopods the fingers have a greater proportionate length than in the adult; the first and second peræopods have the fourth joint distally dilated, the front margin being produced into a pointed apex, within which lies a somewhat curved spine as long as the apical process, and having the side pectinate which faces the fifth joint; the long third peræopod has a broad fourth joint with the front margin smooth, ending in a small apical tooth, within which is planted a spine that projects beyond it; the much narrower fourth joint of the fourth peræopods is similarly armed; the fifth peræopods are feeble as in the adult; the rami of the pleopods, as usual at this stage of development, have only two joints, a long and a short one, the long one having a cleft spine at the upper part.

Primno latreillei, n. sp. (Pl. CLXXIX., A.).

The general outline not differing materially from that of *Primno macropa;* the last segment of the peræon is dorsally pointed behind but not strongly produced.

The Upper Antennæ (in the male) have the first joint of the peduncle as broad as long, the second very short, the third inconspicuous or absent, the flagellum of the specimen figured, consisting of one joint, slightly bent, proximally tumid, the tumid part having a small group of five short filaments at the distal end; the remainder of the joint tapering, crossed by numerous lines indicating the future joints. In fig. *a.s.C.*, from another specimen, the second joint of the peduncle is more distinct, the flagellum with the tumid part forming the first joint, the remainder tapering, indistinctly divided into about eighteen small joints. In the female these antennæ are nearly as in *Primno guerini.*

The Lower Antennæ are shorter and thinner than the upper, the three free joints of the peduncle short, not longer than broad; the flagellum in the specimen figured consisting of one joint, long, curved, narrowing in the distal half, but not to a sharp point; the internal appearance in these as in the upper antennæ indicated a future resolution into numerous joints, and perhaps the surface is marked with rings as in the upper pair, but on the glassy skin this could not be made out with certainty.

In fig. *a.i.C.*, from another specimen, the flagellum is longer and contains twenty distinct joints, of which the first is the longest.

The Mouth Organs show no special characters of distinction from those of *Primno guerini;* in the specimen figured the mandibles have a small one-jointed palp; in the second specimen the mandibular palp was two-jointed, the second joint shorter than the first. The condition of the antennæ, as well as the fact that the mandibular palp had not attained its full number of three joints, indicates that each of the specimens is a male not fully adult.

The Gnathopods show no difference from those of the preceding species, except slight variations in proportion of parts, such as might belong to the individual rather than the species; it may, however, be noticed that the side-plate of the second gnathopod is produced into an extremely sharp point, and the first joint less conspicuously dilated than in the species compared.

First Peræopods.—The side-plate is less produced in front; the indents of the third and fourth joints are more pronounced, and the fourth joint is as long as the fifth.

Second Peræopods.—The fourth joint is longer than the fifth.

Third Peræopods.—The teeth on the front margin of the wrist are as follows, a moderately long one with a denticle on its upper margin, two short, a long, four short, a very long one, two short, a long, and three short, close to the hinge of the fifth joint; the fifth and sixth joints together are not as long as the fourth, and the sixth joint or finger is not half the length of the fifth joint. The teeth of the margin of the fourth joint seem much inclined to vary, depriving them of their value as specific characters; thus in the second specimen in one limb these teeth were as follows—one long, two short, one long, four short, one long, three short, one long, three short, the last of these three being double-tipped; in the other limb they were one long, two short, one long, three short, one broken (probably long), three short, one long, four short, the last double-tipped. In the female specimen the teeth on one limb were—one moderately long, two short, one long, four short, one long, four short, one long, four short, the last double-tipped; on the other limb they were—one long, three short, one long, four short, one long, three short, one long, five short, the last double-tipped.

Fifth Peræopods.—These seem to show the most characteristic differences; the first joint is a good deal narrower distally, having a very convex, slightly serrate, hind margin, and a sinuous front margin which is concave above; the five following joints together considerably shorter than the first joint, the first four with shape and proportions nearly as in *Primno macropa;* the finger half the length of the preceding joint or less, with the front margin nearly straight to the apex, then oblique for a very short distance, that portion pectinate with some microscopic hairs or spinules, the terminal one being the strongest, projecting from the tip of the hind margin which as in the other species is bent sharply round at its apex.

Uropods.—The first and second pairs are in near agreement with those of *Primno guerini*; the third pair differ by the smoothness of the margins, the outer having four indents, distant, the intervals not pectinate; in all three specimens examined the distal ends of this pair were broken, an accident which might easily happen to structures of so slight a texture.

Length.—The specimen, in the position figured, measured, in a straight line from the front of the head to the end of the uropods, a fifth of an inch.

Locality.—Station 164D, June 14, 1874; east of Australia; lat. 34° 3′ S., long. 152° 20′ E.; surface; surface temperature, 67°·5. Three specimens, two males, one female.

Remark.—The specific name is given in honour of the celebrated French naturalist, Latreille.

Primno menevillei, n. sp. (Pl. CLXXIX., B.).

This species closely resembles *Primno macropa* in general form and appearance; the first two segments only of the pleon carinate.

Upper Antennæ.—The peduncle of one joint longer than wide, slightly widened distally; the long joint of the flagellum nearly as in the female of *Primno macropa*, with a short row of four pairs of filaments, below which a transverse wrinkle gives the appearance of a division of the joint into two.

The left mandible, lower lip, first maxilla, and second maxilla of the left side, are figured in position in the Plate, both from the outside and the inside. In the figure of the outer side (on the right hand in the Plate), it will be noticed how the convexity of the lower lip, between the front lobe and the mandibular process, fits the concavity of the lower margin of the mandible; in the left hand figure, the mandibular process of the lower lip and its hairy front lobe will be seen peeping out on either side of the molar tubercle of the mandible which hides the central part of the lower lip.

The finger, nail, and distal part of the hand of the first gnathopod are more highly magnified in one of the figures of the species, to show the character of the pectinate hairs on the margin, but this character belongs also to the other species. It is not always easily observed, because its prominence depends on the particular position in which the joints are seen. The true length of the finger is often obscured by its not being outstretched.

Second Gnathopods.—The first joint greatly dilated.

First Peræopods.—The front end of the side-plate is rounded.

Third Peræopods.—The first joint is not very much wider below than above; the teeth of the front margin of the wrist are as follows, the first short, slightly indented on

the upper side, the second long, then two short, a long, three short, a long, two short, a long, and a strongly cleft one adjoining the hinge of the fifth joint; of the cleft tooth the hinder division is the broader and has part of its hind margin finely serrate; the fifth and sixth joints together are scarcely as long as the fourth, the fifth is slender, the finger not quite half its length.

Fourth Peræopods.—The decurrent apical tooth of the hind margin in the third joint is not very long; the front margin of the fourth joint has five teeth, two very small and three larger; it exceeds the length of the third joint.

Fifth Peræopods.—The upper part of the first joint considerably wider than the distal end, the remaining joints together shorter than the first, proportions between them as in *Primno guerini*, except that in the present species the finger is only half the length of the fifth joint; the pectinate distal border of the finger forms a decided angle with the front margin.

The First Uropods differ from those of *Primno macropa* by having the inner margin produced into a small tooth at a little distance from the apex of the plate; the third pair differ by having the inner as well as the outer margin produced into a tooth, the serrate distal margin being produced into an apex between and beyond them.

Telson triangular, not broader than long.

Length.—The length of the specimen was a little over a fifth of an inch.

Locality.—March 9–10, 1874, south of Australia; lat. 48° 18′ S., long. 130° 4′ E.; surface; surface temperature, 52°·3. One specimen, female.

Remarks.—The specific name is taken from the addition to his name which Guérin assumed, thereby becoming Guérin-Méneville; an undescribed species was named "*Primno Guerinii*" by White in 1847.

Primno antarctica, n. sp.

Postero-lateral angles of the third pleon-segment not produced.

Upper Antennæ.—The peduncle cylindrical, a single joint longer than broad; the flagellum a single joint little longer than the peduncle, strongly tapering, carrying three filaments above the centre, and one or two setules near the apex.

Gnathopods as in *Primno latreillei.*

First Peræopods.—Second joint as long as the third; third with a minute sub-apical tooth to the hind margin; fourth joint longer than the fifth, with a tooth at the middle of the hind margin, and a larger apical tooth, within which there is a spine not quite so long as the tooth; fifth joint smooth, a little bent at the base; the finger strongly curved at the tip, more than half the length of the fifth joint.

Third Peræopods.—First joint channelled behind, expanded a little below the base,

the lower part of the front margin being slightly convex and very shallowly serrate, the hind margins straight; the second joint channelled behind, the front margin with an acute apex, very little produced; the third joint distally rather broader than the length, the front apex and one of the hinder apices acute, scarcely produced; the fourth joint with the apex of the hind margin acute, not produced; the teeth of the front margin reckoning from the base are, two small, a large one, two small, a very large one, a small one, a very large one, two small ones, the last being double-tipped; the fifth joint is narrow, much shorter than the fourth, its extremity when folded back touching the tip of the third tooth (reckoning from the base); the finger more than half the length of the fifth joint, strongly curved apically.

Fourth Peræopods.—First joint with convex front margin, having some faint distal serration; the third joint widening distally, the front apex acute, not produced, the hinder apex not acute; the fourth joint with three teeth along the front margin; the fifth joint much narrower than the fourth and a little shorter, its front margin spinulose, the apical pectinate; the finger much more than half the length of the preceding joint, apically curved.

Fifth Peræopods.—The first joint not so long as the remaining joints together, as broad as the first of the preceding pair but not so long, the front margin bulging out near the base, then straight, the hind margin convex, slightly crenulate; the second and third joints short, equal in length; the fourth longer than the two preceding together; the fifth longer than the fourth; the sixth shorter than the fourth, rather more than half the front margin smooth and straight or a little convex, the remainder set obliquely, with a row of straight outstanding hairs or spinules and an apical bent nail-like spine.

Pleopods.—Coupling spines with two pairs of lateral teeth below the apical; arms of the cleft spine very slender, that with the subapical dilatation the longer; joints of the rami six or seven in number.

Uropods.—The first pair long and narrow, with a single minute tooth to the inner margin, some way above the very narrow apex; the rest of the ornamentation is extremely minute, but there is some shallow serration of the lower part of the outer margin; the second pair shorter than the first, with the inner margin smooth except for fine furring, the outer convex, with three little teeth, the apex acute; the third pair shorter than the first, longer than the second, broader than either, yet not very broad, having on the outer margin two small teeth and near the apex one very long one; on the inner margin there is one tooth, higher up than the long one of the outer margin; the finely pectinate apex is produced considerably beyond both.

Telson small, not longer than the breadth at the base, rounded, but with a slight apical narrowing.

Length, three-twentieths of an inch.

Locality.—February 21, 1874, Antarctic Ocean; lat. 63° 30′ S., long. 88° 57′ E.; surface; surface temperature, 32°·5. Two specimens.

Remarks.—The specific name refers to the place of capture. The narrow and apically outdrawn third uropods are a very distinctive feature of this species.

The following table shows the distribution of the genus *Primno* as illustrated by the Challenger specimens :—

1. Station 354, May 6, 1876; North Atlantic; lat. 32° 41′ N., long. 36° 6′ W.; tow-net. One specimen, female, a third of an inch long, mounted in Canada balsam (probably *Primno macropa*).

2. Station 319, February 12, 1876; South Atlantic; lat. 41° 54′ S., long. 54° 48′ W.; surface. One specimen, a little over a tenth of an inch long.

3. Station 318, February 11, 1876; South Atlantic; lat. 42° 32′ S., long. 56° 29′ W.; 2040 fathoms, tow-net at trawl. One specimen, young male, less than a fifth of an inch long, mounted in Canada balsam along with other species, including a small *Podocerus falcatus*, Montagu. A second specimen, differently mounted, two-fifths of an inch long.

4. January, 1874, Kerguelen Island. One specimen mounted in Canada balsam, a third of an inch long, marked "Phronima sp."

5. Station 154, February 19, 1874; Antarctic Ocean; lat. 64° 37′ S., long. 85° 49′ E. Three specimens, mounted in Canada balsam, the largest one-tenth of an inch long (probably *Primno antarctica*).

6. February 20, 1874, Antarctic Ocean; lat. 63° 49′ S., long. 87° 24′ E. Two specimens, mounted in Canada balsam, the larger three-twentieths, the smaller one-tenth, of an inch long (probably *Primno antarctica*).

7. February 21, 1874, Antarctic Ocean; lat. 63° 30′ S., long. 88° 57′ E.; surface. Two specimens (*Primno antarctica*).

8. March 9–10, 1874, south of Australia; lat. 48° 18′ S., long. 130° 4′ E.; surface; One specimen (*Primno menevillei*).

9. Station 159, March 10, 1874; south of Australia; lat. 47° 25′ S., long. 130° 22′ E. One specimen, mounted in Canada balsam (probably *Primno menevillei*).

10. Station 164D, June 14, 1874; east of Australia; lat. 34° 3′ S., long. 152° 20′ E.; surface. Three specimens (*Primno latreillei*).

11. Station 165, June 17, 1874; between Sydney and Wellington; lat. 34° 50′ S., long. 155° 28′ E. Three specimens (*Primno latreillei*).

12. Station 287, October 19, 1875; South Pacific; lat. 36° 32′ S., long. 132° 52′ W.; surface. One specimen (*Primno macropa*).

The range of the Challenger specimens is therefore from lat. 32° 41′ N. to lat.

64° 37′ S. To the range which they show from east to west there are only two localities to be added from earlier sources, namely, the waters of the Pacific off Chili, in which Guérin's type specimen was obtained, and the Atlantic, lat. 8° S., long. 46° E., which White gives for his *Primno guerinii*.

Family Phorcidæ, Spence Bate, 1862.

Spence Bate in 1862 established the Phorcidæ as the fourth family of the division Hyperina, placing it between the family Platyscelidæ and the family Oxycephalidæ; in the definition of the family he includes the character "third pair of pereiopoda imperfectly developed," but as all the joints of the third peræopods are present, and some of them of unusual length, the mere fact of their tenuity can scarcely be described as imperfect development. Bovallius in 1887 gives the following diagnosis:—

"Head nearly globular, a little tumid, deeper than the body. Eyes occupying the lower parts of the sides or the whole sides of the head. First pair of antennæ fixed at the anterior side of the head; first joint of flagellum tumid, the rest subterminal. Second pair few-jointed, short, not angularly folded, fixed at the inferior side of the head. Mandibles with palp (in the males), or wanting palp (in the females). Seventh pair of pereiopoda [*Fifth Peræopods*] reduced. Peduncles [?uropods] normal."

As far as I know, no description distinctly referring to the mandibles of the female in any species of this family has yet been published.

Genus *Phorcorrhaphis*, n. n. (*Phorcus*, Milne-Edwards, 1830).[1]

1830. *Phorcus*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 391 (extr., pp. 34, 40).
1837. „ Burmeister, Handbuch der Naturgeschichte, Abth. ii., Zool.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 235.
1840. „ Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 79.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1000, 1006, 1442.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 339.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 485.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 28.
1887. „ Claus, Die Platysceliden, p. 66.

For the original definition of the genus, see Note on Milne-Edwards, 1830 (p. 142). The following descriptions of new species will show that the size of the second peræon-segment does not at any rate afford a generic character, and that the fourth peræopods

[1] *Phorcus* being preoccupied by Risso in 1826 for a genus of Mollusca, the name is altered to *Phorcorrhaphis*, from *Phorcus* and ῥαφίς, a needle, in reference to the needle-like third peræopod.

are by no means always longer than the third, the reverse being more probably always the case; the length of the fifth peræopods, together with their possession of a full complement of joints, makes it inappropriate to speak of them as "presque rudimentaires."

Phorcorrhaphis zamboangæ, n. sp. (Pl. CLXXX.).

First segment of the peræon longer than the next two united.

Eyes obscure, probably covering the sides of the head.

Upper Antennæ.—The first joint of the peduncle scarcely longer than broad, perhaps representing the first two joints coalesced; a short second (or third) joint seems on the under side to be coalesced with the flagellum, of which the first joint is longer than the peduncle, tumid, tapering, the breast seemingly prepared for about fifteen transverse rows of filaments; on the upper side there is a small slender second joint affixed, which does not reach the apex of the first. The remainder missing.

Lower Antennæ attached below near the back of the head, much smaller than the upper; third (first free) joint once and a half as long as the fourth; fourth not broader than long; fifth about as long as the first, a setule at the lower apex; these three joints in a continuous line; the first joint of the flagellum equal in length to the last of the peduncle, half its breadth, bent down at right angles to it; the second joint minute, blunt, narrower than the first and not half its length.

Mouth Organs very small and feeble; the *Epistome* appears to be shallow and flat-topped; of the *Mandibles* four figures are given, one of part of a mandible in connection with the epistome, two of a mandible in connection with the maxillipeds, and one of part of a mandible flattened out and showing the dentate cutting edge, but owing to the minuteness of the objects these figures are all more or less speculative; if the appearances can be trusted the *First Maxillæ* consist each of a single long plate apically armed with a few straight spines, and the *Second Maxillæ* each of a narrow triangular unarmed plate; the *Maxillipeds* are broad, the inner plate broad, distally rounded, and smooth-edged, the outer plates folding partially round its sides and projecting not far beyond it.

First Gnathopods small and smooth. The first joint with convex margins, narrowest at each extremity, not so long as the four following joints together, the muscles occupying a very small space; the second joint a little curved, longer than broad, longer than the third joint; the fourth longer than the second; the fifth longer than the fourth, with both margins convex, but the front the more so; the finger more than half the length of the fifth joint.

Second Gnathopods longer than the first, not inserted close to them, the structure very similar but the first joint narrower; the third joint as long as the second, the finger as

long as the fifth joint, slightly curved, of nearly uniform breadth till close to the apex, which is prolonged by an almost setiform nail, with a setule on the inner side.

First Peræopods stouter than the gnathopods, and longer, with smooth margins, the first joint widening distally, the second rather longer than broad; the third longer and broader than the fourth; the fifth joint slightly curved, a little longer than the third, with an exceedingly minute pectination of the distal margin; the finger small, with the base much wider than the rest.

Second Peræopods like the first, but longer, the third joint as long as the fifth.

Third Peræopods.—Branchial vesicles oval, very small. First joint twice as long as the branchial vesicles, rather narrowly oval, longer and considerably broader than the first joint of the preceding pair, having minute submarginal setules along the front; second joint a little longer than broad; third joint straight, narrow, longer than the first, fringed with between twenty and thirty little submarginal setules along the front; fourth joint shorter and more slender than the third, similarly furnished, its length on one side of the specimen longer than that of the first joint, on the other side shorter; fifth joint linear; armed along the front with distant microscopic spinules or setules; the tip of the narrowly tapering joint broken off, but the part remaining exceeding the length of the long third joint.

Fourth Peræopods.—Branchial vesicles a little longer than in the preceding pair, the limb shorter. The first joint longer than in the third peræopods and twice as broad, with a few little setules along the front, which has an occasional mark of serration, the most pronounced being at the apex; the second joint not longer than broad; the third joint nearly as broad as the first and not very much shorter, the hind margin extremely convex, the apex broadly produced downwards, with some microscopic pectination or furring of its margin, the front border with a slight serrature of six teeth and the apex acute; like the two following joints it has some tiny submarginal spinules or setules; the fourth joint much shorter than the third and little more than half the breadth, the hind margin convex, the front cut into eight or more decurrent teeth; the fifth joint a little longer than the fourth, much narrower, the front margin cut into fourteen decurrent teeth, the narrower apical border finely pectinate and having at the back two produced teeth; the finger small, tapering; the tip broken.

Fifth Peræopods slender, longer than the gnathopods. The first joint narrowest distally, as long as the three following joints together, the muscles occupying a very small part of the joint; the second joint longer than broad; the third slender, curved, smooth like the rest of the limb; the fourth rather longer than the third; the fifth shorter than the third; the finger very small and crooked.

Pleopods.—Peduncles stout, those of the first and second pairs longer than the rami; coupling spines minute, round-headed, with only the apical pair of retroverted hooks; the cleft spine slender, rather sinuous, the two arms nearly equal; the first joint of the

inner ramus having two plumose setæ on the inner margin below the cleft spine; the first joint of the outer ramus having on the outer margin two short setæ and one long one; the inner ramus has five joints, the outer six.

Uropods.—Peduncles of the first pair not longer than the rami, the distal margin minutely pectinate; outer ramus shorter and narrower than the inner, the lower part of each margin cut into decurrent teeth, the upper part of the margins very finely pectinate, the inner ramus with the teeth occupying more of the margins than in the outer ramus; peduncles of the second pair scarcely as long as the outer ramus, which is much shorter and narrower than the inner, with the outer margin smooth almost to the apex, the inner margin as in the preceding pair; the outer ramus is similar to that of the first pair, a little broader; the peduncles of the third pair not longer than broad; the outer ramus the shorter, with the outer margin almost straight and smooth, the inner convex, minutely pectinate for some distance, and with five decurrent teeth not far from the acute apex; the inner ramus with rather sinuous inner margin, at first smoothly convex, then cut into three or four little decurrent teeth, below which the ramus forms two lobes, the outer little more than a third the length of the inner, with smoothly rounded apex, the inner being a little sinuous, of nearly uniform breadth to the narrowly rounded tip, at which there is a little fold of the inner margin.

Telson of rather peculiar form, nearly twice as long as broad, reaching to the end of the outer ramus of the third uropods and equalling in length the inner ramus, the lateral margins sinuous, so that the apical half of the telson is much narrowed, distally tapering to a narrowly rounded apex.

Length of the specimen, in the slightly bent position figured, a little less than one-fifth of an inch.

Locality.—Station 202, October 27, 1874; off Samboangan,[1] Philippine Islands; lat. 8° 32′ N. long. 121° 55′ E.; surface temperature, 83°. One specimen, male.

Remarks.—The specific name is taken from the place of capture named on the label. The rami of the third uropods are the most distinctive feature of the species. A second specimen, which must, I think, belong to this species, was taken at Station 81, July 13, 1873; North Atlantic; lat. 34° 11′ N., long. 19° 52′ W.; north-west of Madeira. This specimen shows the eyes occupying the sides of the head, the first flagellum joint of the upper antennæ with a large brush of filaments, the second with three broad ones on the inner margin, the third with two and a setule, the fourth about as long as the second, shorter and much thinner than the third, with two setules at the tip; this last joint reaches a little beyond the apex of the first but not beyond its filaments; the postero-lateral angles of the first three pleon-segments are rounded; the limbs are rather stouter than in the eastern specimen, and the fourth peræopods have the third joint more

[1] Also spelt "Zamboanga," whence the specific name.

elongate, with the apices more acute, as is also the case with the fourth joint, the marginal armature of the whole limb being stronger; also in the fifth peræopods the first joint is more dilated; the inner ramus of the pleopods has six, the outer seven, joints; the length of the specimen in a slightly curved position was one-fifth of an inch.

Phorcorrhaphis edwardsi, n. sp. (Pl. CLXXXI.).

First segment of the peræon as long as the two following together; postero-lateral angles of the first pleon-segment squared, of the two following segments obtuse.

Eyes occupying the sides of the head.

Upper Antennæ similar to those of *Phorocorrhaphis zamboangæ*, but of the three subterminal joints of the flagellum the first is the longest; the large first joint of the flagellum has a great brush of filaments.

Lower Antennæ minute as in the species just mentioned, the terminal joint of the peduncle longer than the two preceding together, and also longer than the two-jointed flagellum.

Mouth Organs very minute, not made out with sufficient distinctness for description; the general character, as might be expected, the same as in the preceding species.

First Gnathopods.—First joint elongate, oval, as long as the four following together, gland-cells large; the second joint a little longer than broad; the third a little longer than the second, with oblique distal margin; the wrist longer than the third joint, a little shorter than the hand, which is straight, with the margins very slightly convex; the finger curved, half the length of the hand, or rather more.

Second Gnathopods.—All the joints longer than in the first gnathopods, the first joint more slender, longer than the four following joints together; the wrist and hand each a little longer than the third joint; the finger almost straight, very slender, tipped with a slender nail, and with this as long as the hand.

First Peræopods longer and much stouter than the gnathopods, the margins almost entirely smooth. The first joint not much longer than that of the second gnathopods, the second longer than broad, the third longer than the fourth, subequal in length to the slightly curved fifth; the finger about half the length of the fifth joint, bent.

Second Peræopods like the first, but with most of the joints longer; the bent finger not half the length of the fifth joint.

Third Peræopods.—Branchial vesicles shorter than the first joint, narrow at the neck, widened below, with an indent in the lower margin. The limb similar to that of *Phorcorrhaphis zamboangæ*, the first joint rather more widened near the base, with four or five little indents along the front margin, the third joint considerably longer than the first, the fifth longer than the third and much longer than the fourth. In one specimen, mounted in Canada balsam during the voyage, one of the extremely fragile

third peræopods is complete; in this, the needle-like fifth joint is more than twice the length of the fourth, fringed along the front margin with thirty or more tolerably distant setules; the finger is almost straight, about half the breadth of the apical part of the fifth joint, and perhaps not more than a tenth of the length of that joint, and yet from its tenuity having an elongate appearance; the nail is small, setule-like.

Fourth Peræopods shorter than the third. Branchial vesicles more widened below than in the preceding pair, but not on the whole larger. First joint longer than in the preceding pair and more than twice as broad, the convex hind margin sometimes, but not always, having a little indent, the front with five or six small serration-teeth, the gland-cells large; the second joint scarcely longer than the proximal breadth, with two or three submarginal setules; the third joint expanded for gland-cells, broad except at the point of attachment, much longer than broad, but not so long as the first joint, the front margin with five or six serration-teeth, the hinder apex more produced than the front one, neither of them acute, each with a little pectination of the adjacent distal margin, stronger behind than in front; the fourth joint subequal in length to the third, only half the breadth, the front margin cut into twenty-three decurrent teeth, the hinder distal margin finely pectinate; the fifth joint as long as the first, more slender than the fourth, tapering, its front margin cut into numerous decurrent teeth; the finger minute, curved.

Fifth Peræopods slender, longer than the gnathopods, about as long as the first peræopods; the first joint slender, longer than the third and fourth together; the second short, but longer than broad; the third curved, shorter and not broader than the fourth; the fourth rather less curved; the fifth shorter and more curved than the third; the finger minute, curved, much wider at the base than distally.

Pleopods.—Coupling spines not observed; the cleft spine with the dilated arm the longer, its dilatation unsymmetrical and followed by a much produced point; the first joint of the inner ramus has a sinuous apically pointed interlocking process, the pleopods in this and other respects being probably in close agreement with those of *Phorcorrhaphis zamboangæ;* the inner ramus has six joints, the outer seven.

Uropods.—The peduncles of the first pair shorter than the rami; the outer ramus narrower but only a little shorter than the inner, finely pectinate near the base, and cut into decurrent teeth for the greater part of each margin; the inner ramus reaching as far as the apex of the outer of the third pair, with most of the outer margin and the distal part of the inner denticulate; the peduncles of the second pair shorter than those of the first, and shorter than the rami; the outer ramus shorter and narrower than the inner, with its outer margin almost smooth, the inner denticulate, the inner ramus nearly as long as the outer of the first pair and ornamented like the inner ramus of that pair; the peduncles of the third pair widening distally, so that the distal margin equals the length, the rami longer than the peduncles, the outer shorter and much narrower than the inner, its outer margin almost smooth, the inner pectinate and denticulate, the broadly lanceolate

inner ramus having the upper part of the margins smooth, the lower part strongly denticulate.

Telson triangular, as broad as long, a little longer and broader than the peduncles of the third uropods.

Length, in the slightly bent position figured, one-fifth of an inch.

Locality.—April 3, 1875; North Pacific; lat. 24° 49′ N., long, 138° 34′ E.; surface; surface temperature, 71°·5. Two specimens, male.

Remarks.—The specific name is given in honour of Milne-Edwards, who instituted the genus *Phorcus*. Two specimens, mounted in Canada balsam during the voyage, one of which has been referred to above, are labelled "Amphipod, surface, Australia." They are both males and evidently belong to this species. A specimen taken March 15, 1874; south of Australia; lat. 39° 45′ S., long. 140° 40′ E.; surface temperature, 60°·2, has the inner ramus of the third uropods reaching as far back as the inner ramus of the third pair, and the telson decidedly longer than broad.

Dana's *Phorcus hyalocephalus*, from the Atlantic, is distinguished from both the Challenger species by having the first two segments of the peræon nearly concealed. "*Phorcus Reynaudii*" or "*Raynaudii*," as described by Milne-Edwards, has the second segment of the thorax or peræon "notablement plus développé qu'aucun des six autres segmens," and, as described by Spence Bate, it has the fourth joint of the third peræopods longer than the third joint, the fifth of the same length and thickness as the fourth, and the finger longer than the fifth joint and of the same diameter. In "*Phorcus Lovéni*," Bovallius, from the Caribbean Sea, the first gnathopods are said to be as long as the second, and the first segment of the pleon is said to be shorter than the last two segments of the peræon.

The following table shows the distribution of the genus *Phorcorrhaphis* as illustrated by the Challenger specimens:—

1. Station 81, July 13, 1873; Atlantic, north-west of Madeira; lat. 34° 11′ N., long. 19° 52′ W. One specimen (*Phorcorrhaphis zamboangæ*).

2. Off Australia; surface. Two specimens (*Phorcorrhaphis edwardsi*).

3. March 16, 1874; south of Australia; lat. 39° 22′ S., long. 142° 27′ E.; surface. One specimen.

4. March 15, 1874; south of Australia; lat. 39° 45′ S., long. 140° 40′ E.; surface. One specimen.

5. Station 288, October 21, 1875; South Pacific; lat. 40° 3′ S., long. 132° 58′ W.; surface. One specimen, nearly a quarter of an inch long (probably *Phorcorrhaphis zamboangæ*).

6. Station 181, August 25, 1874; Pacific, between Api and Cape York; lat. 13° 50′ S., long. 151° 49′ E.; surface. Three specimens.

7. Station 202, October 27, 1874; off Samboangan; lat. 8° 32′ N., long. 121° 55′ E. One specimen (*Phorcorrhaphis zamboangæ*).

8. April 3, 1875, North Pacific; lat. 24° 49′ N., long. 138° 34′ E.; surface. Two specimens (*Phorcorrhaphis edwardsi*).

Only three other localities have been hitherto recorded for this genus, a different species coming from each locality,—*Phorcus reynaudii*, Milne-Edwards, from the Indian Ocean; *Phorcus hyalocephalus*, Dana, from the "Atlantic, latitude 1° south, longitude 18° 20′ west"; and *Phorcus lovéni*, Bovallius, from the Caribbean Sea. Bovallius alone makes any reference to the females of this genus, and he only incidentally in giving the characters of the family; all the Challenger specimens appear to be of the male sex.

Genus *Lycæopsis*, Claus, 1879.

1879. *Lycæopsis*, Claus, Die Gattungen und Arten der Platysceliden, pp. 32, 41.
1887. „ Bovallius, Systematical List of the Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 29.
1887. „ Claus, Die Platysceliden, p. 66.

For the shorter of the original definitions of this genus, see Note on Claus, 1879 (p. 493). In 1887 Claus places the genus next to *Phorcus*, and describes it to the following effect:—

"Form *Lycæa*-like, with thick deep head, elongate peræon and pleon. Segments of the peræon comparatively long, strongly imbricated, especially the two segments carrying the Gnathopods. Front Antennæ of the female five-jointed, with long stiliform terminal joint, those of the male with three-jointed flagellum. Hinder antennæ short, with hook-like bend, five-jointed, without counting the extensive basal-plate which has a joint-like distinctness. The eyes extended over almost the whole surface of the head with large pigment mass. Mandibles outdrawn, stiletto-like. Maxillipeds with large split inner plate, and broad outer plates with shell-like curvature (schalenförmig gebogenen). Gnathopods weak, simple; the first pair with large gland-cells in the dilated first joint, those of the second pair thinner and more elongate. Laminar first joint in the third and fourth peræopods comparatively elongate, that of the latter much the more extensive. Fourth peræopods very strong, much longer than the preceding pair, almost twice as long. The fourth and fifth joints of this pair considerably elongated and with pectinate front margin. Fifth peræopods feeble, but elongate, with the full number of joints. Branchial vesicles limited to the fifth and sixth segments. Peduncles of the first pair of uropods as long as the leaf-shaped rami."

Bovallius in the same year, 1887, places the genus in the family Phorcidæ, to which it clearly belongs.

Lycæopsis pauli, n. sp.

Head much deeper than long, deeper than the peræon; postero-lateral angles of the first three pleon-segments squared, or with scarcely perceptible outdrawn points; the fourth pleon-segment shorter than the following composite segment.

Upper Antennæ lying directed downwards within the frontal groove of the head; first joint longer than the second; the third longer than the preceding two together, tapering, with filaments on the inner margin; the following joint short and almost linear.

Lower Antennæ placed just behind and above the mouth organs; the joint containing the gland-cone partially free, the next or third joint of the peduncle longer than the fourth, but slightly shorter than the fifth; the flagellum at right angles to the peduncle, the first joint shorter and much narrower than the last of the peduncle, the second or terminal joint not half the length of the first.

First Gnathopods.—First joint with the front margin almost straight and the hind margin nearly parallel to it, the joint being very slightly dilated above; the larger part of it occupied by the gland-cells; the second joint longer than broad, bent; the third scarcely so long as the second, the fourth rather longer than the second, with convex front margin; the fifth longer than the fourth, narrowed distally; the finger curved, strong, much more than half the length of the fifth joint, the limb seemingly smooth throughout.

Second Gnathopods.—The first joint narrower than in the first pair, with parallel margins, the front convex, the hinder concave; the second joint considerably longer than broad, the third longer than the second, the fourth not longer than the third; the fifth longer than the fourth; the finger rather longer than the hand, almost straight, with a narrow, slightly curved, acute nail.

First Peræopods much longer and stouter than the gnathopods; the first joint straight, a very little widened below; the second joint with the hinder margin longer than the breadth of the joint; the third joint longer and broader than the fourth, with convex front margin; the fifth joint longer than the fourth, scarcely so long as the third, tapering, a little curved; the finger not half the length of the fifth joint, bulbous at the base, then suddenly narrowed and bent, the terminal part straight, tapering to a sharp point, the distal division being longer than the proximal; the limb like the gnathopods almost entirely smooth.

Second Peræopods scarcely differing from the first, except that the joints are rather longer.

Third Peræopods.—Side-plates bilobed, broader than deep. Branchial vesicles small scarcely half the length of the first joint, irregularly oval, narrower at the neck than distally. The first joint expanded but not widely, neither margin being strongly convex,

the front serrate with six distant teeth, of which the apical is the longest; the second joint a little longer than broad; the third joint narrower than in the second peræopods, straight, with three distant teeth on the front margin. The rest of the limb missing.

Fourth Peræopods much larger than the third, but not as disproportionate as in *Lycæopsis themistoides*, Claus. Branchial vesicles little larger than the preceding pair, scarcely half the length of the first joint, narrow at the neck, the remainder an oval, broad at both ends. The first joint not much longer but much more widely expanded than in the preceding pair, the front margin serrate in the same manner; the second joint a little longer than broad; the third joint straight, three-quarters of the length of the first joint, much longer than the fourth, the front margin serrate with eight or nine teeth; the hind margin smooth, except for a little apical setule; the fourth joint with the front margin divided into ten decurrent teeth, closely set; the fifth joint slightly curved, longer than the third, nearly as long as the first, the front margin slightly concave, serrate with sixteen adpressed teeth, which near the apex become longer and more distant than higher up; the finger small, the hind margin forming a tooth, beyond which the remaining quarter of the joint projects like a nail.

Fifth Peræopods.—Side-plates broader than deep, narrowly outdrawn behind. The first joint not nearly so long as the third, fourth, and fifth joints together, a little widened for gland-cells at the upper part, the front margin straight, the hinder convex till near the apex; the second joint longer than broad, the third twice the length of the second, the fourth longer than the third, the fifth longer than the fourth in one of the limbs, not longer in the other; the finger very small, with bulbous base and strongly curved termination; the total length of the limb exceeding that of the first joint of the preceding pair.

Pleopods.—Coupling spines minute; the cleft spine with unsymmetrical subapical dilatation of the longer arm; the inner ramus with four joints, the outer with five.

Uropods.—Peduncles of the first pair reaching the end of the coalesced segment, about as long as the rami; the rami reaching nearly as far back as those of the third pair, the inner margin and lower part of the outer cut into decurrent teeth; the peduncles of the second pair reaching nearly as far as those of the first, longer than the outer, shorter than the inner, ramus; the outer ramus much shorter and narrower than the inner, seemingly with both margins smooth, the inner ramus ornamented like those of the first pair; the peduncles of the third pair little longer than broad; the outer ramus rather shorter and much narrower than the inner, smooth; the inner with teeth on less than half the outer, and more than half the inner, margin.

Telson extremely transparent, so that its boundaries are difficult to observe, very little longer than broad, the sides at first convex, then flattened, converging to a broadly rounded apex, about a third of the length being beyond the peduncles of the third uropods.

Length, at full stretch, one-tenth of an inch.

Locality.—Station 108, August 27, 1873; off St. Paul's Rocks; lat. 1° 10′ N., long. 28° 23′ W.; surface; surface temperature, 78°. One specimen, female, with eggs.

Remarks.—The specific name is taken from the place of capture. Bovallius describes a species of this genus, *Lycæopsis lindbergi*, from "tropical parts of Atlantic," but it differs from the present in having the joints of the fourth peræopods very dilated, the third joint of that pair longer than the fifth; the first joint of the fifth peræopods dilated, ovate; the peduncles of the second uropods shorter than the outer ramus, the coalesced fifth and sixth segments of the pleon longer than the third uropods, and the telson nearly twice as long as the peduncles of those uropods. From *Lycæopsis themistoides*, Claus, a specimen of which has been sent me by Dr. Bruce from the neighbourhood of Malta, the present species differs as well by its more diminutive size, as in having the fourth joint of the fourth peræopods shorter instead of longer than the third; the first joint of the fifth peræopods not quite linear, and shorter than the third, fourth, and fifth joints together; the composite segment of the pleon not shorter than the third uropods, and in some other particulars.

Family Typhidæ, Dana, 1852.

Milne-Edwards in 1840 established the "Tribu des Hypérines anormales" for the genera *Typhis*, *Pronoe*, and *Oxycephalus* (see Note on Milne-Edwards, 1840, p. 190). In 1852 Dana established the equivalent family Typhidæ, with additional genera distributed among three subfamilies, Typhinæ, Pronoinæ and Oxycephalinæ (see Note on Dana, 1852, p. 259). In 1862 Spence Bate united the first two of these subfamilies to form the family Platyscelidæ (see Note on Spence Bate, 1862, p. 337). Claus in 1879 adopted the title Platyscelidæ as the equivalent of Milne-Edwards' *Hyperina anomala*, including under it the five families, Typhidæ, Scelidæ, Pronoidæ, Lycæidæ, Oxycephalidæ (see Note on Claus, 1879, p. 490). Bovallius in 1887 drops the divisional or tribal title Platyscelidæ, but retains the five families, naming them respectively Eutyphidæ, Parascelidæ, Pronoidæ, Tryphænidæ, Oxycephalidæ (see Note on Bovallius, 1887, p. 590).

The earliest description of any species belonging to this group appears to be that given of *Oniscus gibbosus* by J. C. Fabricius in 1775 (see Notes on Fabricius, 1775, p. 40, and 1793, p. 59). This species, which was afterwards called *Gammarus gibbosus*, and which probably belongs to the Pronoidæ, is figured in the Banksian Museum among the zoological drawings by Sydney Parkinson in Captain Cook's First Voyage, with the name "*Onidium gibbosum*, T. 16. P. Sept. 7. 1768."

For the Eutyphidæ Bovallius gives the following diagnosis:—

"Body very broad. Head large, deeper than the body, a little produced anteriorly. Eyes large, occupying the whole sides of the head. First pair of antennæ fixed at the under-side of the head; first joint of flagellum tumid, the rest of flagellum subterminal. Second pair fixed at the under-side of the head, angularly folded (♂) or wanting (♀). Mandibles with palp. Femora of fifth, sixth and seventh pairs of pereiopoda [first joint of *Third*, *Fourth*, and *Fifth Peræopods*] transformed into perfect opercula. Seventh pair [*Fifth Peræopods*] reduced."

Genus *Platyscelus*, Spence Bate, 1861.

1816. *Typhis*, Risso, Hist. Nat. des Crust. des environs de Nice, p. 122.
1818. „ Lamarck, Hist. Nat. des Anim. sans vertèbres, t. v.
1818. „ Leach, Dict. d. Sci. Nat., t. xii., Art. Crustacés.
1825. „ Desmarest, Consid. gén. sur la classe des Crustacés, p. 281.
1825. „ Latreille, Familles nat. du Règne Animal, p. 289.
1825. „ Guérin, Encycl. Méth. Hist. Nat., t. x., Art. Typhis.
1826. „ Risso, Hist. Nat. Europe Mérid., t. v. p. 94.
1829. „ Latreille, Le Règne Animal, t. iv.
1830. „ Desmarest, in Bosc's Hist. Nat. des Crustacés, éd. ii.
1830. „ (*pars*), Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 395 (extr., pp. 34, 44).
1831. „ Latreille, Cours d'Entomologie.
1837. „ Burmeister, Handbuch der Naturgeschichte, Abth. ii., Zool.
1838. „ Milne-Edwards, Hist. Nat. des Anim. sans vertèbres, t. v.
1840. „ O. G. Costa and A. Costa, Catal. de' Crost. del Regno di Napoli.
1840. „ (*pars ?*), Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 239.
1840. „ (*pars*), Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 94.
1850. „ de Natale, Descr. Zool. Crost. del porto di Messina.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1008, 1443.
1855. „ (*pars*), Gosse, Manual of Marine Zoology, pt. i.
1861. *Platyscelus*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. viii.
1862. *Thyropus* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 326 (*non* Dana).
1862. *Platyscelus*,[1] Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 329.
1871. *Platyscelus*, Claus, Unters. über den Bau und die Verwandschaft der Hyperiden.
1878. „ Claus, Zool. Anzeiger, Jahrg. i. p. 270.
1879. *Eutyphis*, Claus, Die Gattungen und Arten der Platysceliden, pp. 4, 5.
1879. *Platyscelus*, G. M. Thomson, Trans. New Zealand Inst., vol. xi. p. 244.
1885. *Eutyphis*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 424.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 482.
1887. *Eutyphes*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 45.
1887. *Eutyphis*, Claus, Die Platysceliden, p. 31.

For the original definition of the genus *Typhis*, see Note on Risso, 1816 (p. 97). For the brief original definition of *Platyscelus*, see Note on Spence Bate, 1861 (p. 327).

[1] "*Platyscelus Batei*," Streets, 1877, with the wrists of the gnathopods not produced and neither wrists nor hands serrated, cannot belong to this genus, unless based on an incompletely developed specimen.

For the short definition of *Eutyphis*, see Note on Claus, 1879 (p. 490). Since *Thyropus*, Dana, clearly coincides, as indicated by Bovallius, with *Tanyscelus*, Claus, while *Dithyrus*, Dana, is involved in much doubt (being considered by Bovallius to be the same as *Hemityphis*, Claus, and by Claus himself to be the same as *Eutyphis*), the name *Platyscelus* remains as the earliest synonym of the preoccupied *Typhis*. It is unfortunate that *Platyscelus* should come so near to two earlier names, *Platyscelis* and *Platyscelum*, but it is not for all that the same as either. It has also the advantage of being explanatory of the title Platyscelidæ, which Claus has adopted for the group, at the head of which this genus in right of priority may be considered to stand.

Platyscelus ovoides (Risso?).

1879. *Eutyphis ovoides*, Claus, Die Gattungen und Arten der Platysceliden, p. 9.
1887. „ „ Claus, Die Platysceliden, p. 35, Taf. i. figs. 1–11, Taf. ii. figs. 1, 2, Taf. iii. figs. 1–3.

The depression in the front of the head between the eyes and the rostral triangle not transverse as in *Platyscelus armatus*, but triangular.

Eyes.—The lower division approaching the rostrum more closely than in the species just mentioned.

The Second Gnathopods, the *Third*, *Fourth*, and *Fifth Peræopods*, the *Uropods* and *Telson*, as well as the general appearance of the specimen, agree so completely with Claus' figures and description of *Eutyphis ovoides*, that, though its place of capture is so distant from the localities hitherto recorded for the species, there seems no reason to doubt the identification. The *First Gnathopods* were not examined. The third joint in the first, second and third peræopods is here relatively much shorter than in the species next described. In the *Fourth Peræopods* the middle part of the hind margin is setuliferous, but this part is not straight, as it is in *Thyropus ovoides*, Spence Bate.

Uropods.—Peduncles of the first pair with the outer margin and outer part of the distal margin pectinate, the outer ramus a little shorter and narrower than the inner, having its outer margin pectinate, and the distal margin on the inner side of the minute apex also pectinate, but much more finely; the inner ramus has the margins pectinate distally, more finely on the outer than on the inner side; peduncles of the second pair very short, the outer ramus almost smooth, decidedly shorter and much narrower than the inner, the inner having its broad distal margin finely pectinate on either side of the minute apex; the third pair with the outer ramus much shorter and narrower than the inner, not apically widened, pectinate near the apex, more on the inner than on the outer margin; the inner ramus coalesced with the peduncle, pectinate along almost all the outer margin and on the lower part of the inner, apically acute though widened a little above the apex, not reaching quite to the narrowly rounded apex of the telson.

Length.—From the front of the head to the end of the third pleon-segment the specimen measured almost half an inch.

Locality.—Station 243, June 26, 1875; North Pacific; lat. 35° 24′ N., long. 166° 35′ E.; deep tow-net. One specimen, female with numerous eggs.

Remarks.—On various parts the specimen has slightly swollen blotches, probably caused by some parasite.

In *Dithyrus faba*, Dana, the first joint of the fourth peræopods is represented with the terminal part outdrawn as in this species, but it would be rash to identify the two on the existing evidence. Whether Risso's *Typhis ovoides* and Spence Bate's *Thyropus ovoides* are really the same species as Claus' *Eutyphis ovoides* is still perhaps open to question. *Platyscelus intermedius*, G. M. Thomson, from New Zealand, seems scarcely if at all distinguishable from *Platyscelus ovoides*.

Platyscelus armatus (Claus) (Pl. CLXXXII.).

1879. *Eutyphis armatus*, Claus, Die Gattungen und Arten der Platysceliden, p. 10.
1887. *Eutyphes armatus*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 45.
1887. *Eutyphis armatus*, Claus, Die Platysceliden, p. 36, Taf. ii. figs. 3–15.

Head broad, with downward bent, triangular rostrum, the apex of which is wedge-like; a depression crosses the front of the head just below the eyes and above the rostral triangle; the peræon is of great breadth, its first two segments extremely short, especially at the centre; the first three segments of the pleon with oblique lateral depressions; the fifth and sixth segments and the telson coalesced, forming an equilateral triangle, the sides of which neatly fit the straight section of the hind margin in the first joint of the fourth peræopods; the apex of the first joint of the third peræopods reaches the rostral point of the head, the animal being thus able to assume a compact egg-shape, but having the side-plates of the fourth, fifth, and sixth peræon-segments projecting, those of the fifth segment most prominently and sharply.

Eyes large, divided by a narrow central line, occupying all the surface of the head except the front portion already indicated; in each eye a lower division is indistinctly marked off from the much larger dorsal, the lower division not reaching as far as the rostrum.

Upper Antennæ (of the male).—The first joint of the peduncle longer than broad, the second short; the first joint of the flagellum much longer than the peduncle, strongly bent, the convex margin thickly beset with long hair-like filaments, not itself projecting beyond the base of the next joint, which is about twice as broad as long, carrying a few pairs of filaments; the next joint shorter, and not half as wide, with a pair of filaments below the centre, then narrowing; the fourth joint not present in the specimen examined.

Lower Antennæ (of the male).—Third (first free) joint of the peduncle forming a narrow neck, then widening till near the apex, which, however, is wider than the neck, the edges smooth; the fourth joint less than twice as long as the third, widened at the distal end; the fifth joint rather shorter than the fourth; the first joint of the flagellum less than a third of the length of the last of the peduncle, the second joint a very little shorter than the first.

Mandibles.—The trunk sinuous, the palp attached behind the centre; the cutting edge with a rounded strongly projecting tooth at the upper corner, in the left mandible the lower corner also projecting a very little flatly with denticulate edge, the intermediate space striated and very minutely denticulate; each mandible has a secondary plate, triangular, with the front edge closely adjoining that of the principal plate and very similar to it but of smaller extent; on the left mandible there is an additional plate overlapping the lower part of the secondary one, to which it is similar but smaller and with undenticulate edge; the first joint of the palp is considerably the longest, the second a little longer than the third.

First Maxillæ.—The single plate has four teeth at the distal end of the inner margin.

Maxillipeds.—The outer plates broad, with sinuous inner margin and the apex rounded, distally carrying a few setules.

First Gnathopods.—Side-plates with the lower front angle acute, to which there runs a ridge of the inner surface. First joint narrow near the base, then widening a little abruptly with convex front margin carrying distant setules or slender spines; second joint with such spines on the lower part of the hind margin; third joint wrist-like, with slender spines along the hind margin, a few on the surfaces and on the lower part of the front margin; the wrist longer and much broader than the hand, with slender spines distributed as on the preceding joint, but not on the lower part of the denticulate hind margin; the produced hinder apex forms a broad triangle, not as long as the hand, having a dozen little teeth on the inner or front margin; the hand has about fifteen little teeth on the hind margin, and two or three on the apex; the finger is minute, little curved.

Second Gnathopods.—Side-plates with the lower hinder angle rounded and produced a little backwards. The first joint longer than in the preceding pair, with the front margin concave; the third joint longer than in the first gnathopods, and the wrist considerably longer though but little broader, with numerous spines on the inner surface, the produced apex nearly as long as the hand, with about twenty teeth on the inner edge; the hand a little longer than in the preceding pair, with about twenty denticles on the hind margin, and two or three on the apex; the finger as in the first pair.

First Peræopods.—Branchial vesicles very large. First joint longer than that of the second gnathopods, with a narrow neck, then widened, with convex hind margin; second joint longer than broad; third joint curved, elongate but shorter than the first joint, the

front margin convex, the hinder concave, the joint much narrower and more elongate and with the gland-cells less conspicuous than in *Platyscelus ovoides;* the fourth joint shorter and narrower than the third, less curved; the fifth joint straight, much shorter than the fourth; the finger small, narrow, curved, folding closely against the apical part of the fifth joint, which at first bulges a little and is then narrowed, carrying one or two quite minute spines or spine-like processes.

Second Peræopods very similar to the first.

Third Peræopods.—Side-plates forming a strong acutely projecting process; within them there is a small triangular process pointing backwards. First joint two and a half times as long as broad, with the hind margin forming a long bow, the front a little sinuous, faintly serrate, considerably longer than all the remaining joints together, much of the surface showing scale-like sculpture; the third joint stouter and a little longer than the fourth; the fourth with a little pectination at the distal part of the front margin; the fifth rather longer than the fourth, with the front margin finely pectinate; the finger minute.

Fourth Peræopods.—First joint longer and very much broader than in the preceding pair, with the front margin much excavate to receive the convex hind margin of the first joint of the third peræopods, the hind margin very convex at the upper part; then nearly straight, channelled, with a short longitudinal groove of the sculptured surface near and in front of the top of the channelled part, of which the inner margin is fringed with setules; second joint short and bent, considerably above the broad distal margin of the first, and not reaching its hind margin; the third joint longer and broader than the fourth, having the front margin pectinate with teeth which as they approach the apex are retroverted, the apex very slightly produced; the fourth joint armed like the third, the apex not produced; the fifth joint little more than a third as long and less than a third as wide as the fourth, straight, nearly smooth but with some extremely minute pectination of the front margin; finger not observed. This limb and the preceding are figured from the inner surface In fig. *prp.*4, the fifth joint is missing only from a defect in the specimen; the groove of the first joint shows through from the outer surface.

Fifth Peræopods.—The first joint as long as that of the second gnathopods, of tolerably uniform breadth, curved so that the front margin is somewhat concave, the hinder convex; at the extremity of the front margin there are two or three quite minute terminal joints.

Pleopods.—The peduncles stout, strongly produced into a rounded lobe on the inner side, the very small coupling spines being placed above this lobe; the cleft spine not very strong, with subequal arms, one of them having a slight subapical dilatation; the inner ramus with thirteen or fourteen joints, the outer with fourteen or fifteen.

Uropods.—Peduncles of the first pair shorter than the rami, widening distally, set as far apart as possible, the outer margin and outer corner of the distal margin pectinate;

the rami nearly equal, the inner a little the longer, the outer with the outer margin and lower part of the inner pectinate and a small pointed apex, the inner similar, except that of the outer margin only the lower part is pectinate; the peduncles of the second pair little longer than broad; the outer ramus about as large as one of the preceding, the inner considerably larger; peduncles of the third pair not longer than broad; outer ramus shorter than the inner, with smooth outer and pectinate inner margin, the inner ramus apparently coalesced with the peduncle, both margins pectinate for most of their length, the pointed apex not quite reaching the end of the telson.

Telson, reckoning from the bases of the third uropods, broader than long, triangular, with rounded apex, the margins continuous with those of the coalesced segment.

Length of the figured specimen, in its folded position, two-fifths of an inch.

Localities.—April 3, 1875, North Pacific, between New Guinea and Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. Two specimens.

April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night; surface temperature, 73°. One specimen, half an inch long with the pleon flexed. (Figs. *ep.*A. and *mx.*²A.) With this were taken two smaller specimens, not having the acutely projecting side-plates, yet probably belonging to this species, and either presenting one of the stages of growth, or being, as Claus suggests in his description of *Eutyphis inermis*, a smaller unarmed variety.

April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. One specimen, with the acute side-plates, and one specimen unarmed.

Platyscelus rissoinæ, Spence Bate.

1862. *Platyscelus Rissoinæ*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 329, pl. lii. figs. 9, 8*b*, 8*b*′, 8*c*, 8*h*, 8*i*.[1]

The species, at least as represented by the Challenger specimen, has a strong resemblance to *Platyscelus ovoides* (Risso ?) and also to *Platyscelus armatus* (Claus), with which latter species Claus supposed Spence Bate's species might be identical, but our specimen is a large one and yet is without the acutely projecting side-plates, which seem to be a distinguishing character of the adult *Platyscelus armatus;* the following particulars may be noticed :—

Lower Antennæ not as in the type specimen with "the first three joints subequal," but with the first free joint longer than all the following joints together, the second and third subequal to one another, the fourth much more slender than the third and only half its length; there is also a minute fifth joint tipped with a little setule.

[1] Though from the numbering the figures 8*b* to 8*i* appear to refer to "*Thyropus ferus*" (Milne-Edwards), it is clear from the descriptions that they refer to *Platyscelus rissoinæ;* the figures which Milne-Edwards gives of the gnathopods of his *Typhis ferus* are quite different and are not copied in the British Museum Catalogue, which gives only the full figure and the upper antennæ of that species.

First Gnathopods.—The wrist apically squared rather than produced.

Second Gnathopods.—The wrist broader as well as much longer than that of the first pair, the hand, when bent against it, not reaching at all beyond the apex of the wrist's process.

First and Second Peræopods.—The first joint with elongate neck.

Third Peræopods.—Front margin of the first joint not at all serrulate, the fifth joint much shorter than the fourth.

Fifth Peræopods.—The first joint a little narrowed apically.

Uropods.—The rami of the first pair are broad, abruptly narrowed distally, the outer ramus rather shorter than the inner (not, as in Spence Bate's description, equal); of the second pair the proportions were not ascertained (Spence Bate gives the rami equal). In the third pair the apex of the longer inner ramus reaches beyond the telson as in Claus' figure of *Platyscelus armatus.*

Length, sixth-tenths of an inch.

Locality.—Station 172A, July 22, 1874; off Tongatabu; lat. 20° 56′ S., long. 175° 11′ W.; 240 fathoms; surface temperature, 75°. One specimen, female, containing numerous young ones.

Remarks.—The species is separated from the Mediterranean *Platyscelus ovoides* by details of the third and fourth peræopods, in the third pair the first joint having its front margin almost completely smooth instead of finely serrate, and in the fourth pair the first joint having the slit on the outer surface extremely small instead of tolerably long, its position corresponding with that in *Platyscelus armatus.*

The young show some curious differences from the young of Risso's species as figured by Claus. The head corresponds with that described by Spence Bate for the young of his *Platyscelus serratus*, being long and narrow, tapering anteriorly. The mouth organs bulge conspicuously on the under side of the head.

The Upper or Anterior Antennæ are situated on the under surface of the head very near the rounded apex, which is folded under; the first joint thick, longer than broad, the second narrower, not longer than broad, the third much smaller than the second, carrying an apical setule; the first joint of the flagellum nearly as long as the first of the peduncle, with a subapical group of four short filaments, the second joint shorter with four long filaments at the truncate apex, one longer than the other three.

The Lower Antennæ are attached far back, a little above and in front of the base of the mouth organs; the first joint is rather long, the second and third shorter, these three presumably constituting the peduncle; the two following joints are much shorter and slenderer, about equal in length, the terminal one tipped with four filaments, the penultimate having a single subapical filament.

The Gnathopods are peculiar; the first joint is, as in the adult, the longest, it is

distally much widened; the second is longer than the third; the third has a long slender spine at the hinder apex; the fourth or wrist is distally narrowed, with a spine at the apex of the hind margin, and a concave distal margin projecting behind the hand; the hand is much narrower than the wrist, with a short, convex hind margin, while the front is prolonged tongue-like in front of the slender curved finger, the acute apex of which projects a little beyond it, and has an adjacent cilium.

The Peræopods are very like those figured by Claus for the young of *Platyscelus ovoides*.

The First and Second Peræopods have the first joint rather dilated, the second joint about as long as the fourth, the third a little longer than either, with a seta or slender spine at the hinder apex; the fifth joint is longer than the third, which, like the fourth, has the slender spine of the hind margin above the apex; the finger is slender, curved, more than half the length of the fifth joint.

The Third Peræopods have the first joint more dilated than in the following pairs; the second joint is longer than the fourth, about equal to the fifth, the third is longer than the second, these four having each a subapical spine or seta on the front margin, the fifth also one at the apex behind; the finger is curved, with a little acute nail; much more than half as long as the fifth joint.

Fourth Peræopods shorter than the third or fifth; the first joint as long as the other joints together, with the hind margin convex, the front nearly straight; the second joint a little longer than broad, shorter than the fourth joint; the third joint longer than the fourth; the fifth joint shorter than the fourth, and abruptly very much narrower, quite unlike the fifth joint in any of the other limbs; the finger is minute, appearing to form a sharp but very short point in front, behind which there is a fold of the finger scarcely longer than the front, with a cilium in the bend. The second, third, and fourth joints have each a subapical seta, but much smaller than in the preceding limbs.

Fifth Peræopods elongate; the first joint narrower than in the preceding pair, the second joint longer than broad; the third longer than the second, the fourth than the third, the fifth than the fourth; the fifth is slightly narrowed at the neck and apex; the finger is very small, horseshoe-shaped, retractile, capable of lying completely within the narrow truncate apex of the fifth joint.

Pleopods.—Peduncles not longer than the rami. The two coupling spines well-developed; each ramus consisting of two joints, the first broad and long, with a plumose seta at each apex, the second short, as broad as its length, with the usual two apical setæ; there is a small cleft spine near the top of the inner margin of the first joint of the inner ramus.

Uropods.—Peduncles of the first pair as long as the inner ramus; the outer ramus shorter than the inner, both almost smooth, narrowing to rounded apices; peduncles of the second pair shorter than the inner ramus; the outer ramus rather shorter than in the first pair; peduncles of the third pair as long as the short outer ramus; the inner ramus

is longer and broader than the outer, and broader than any of the other rami; in this pair each ramus has a cilium or setule at the rounded apex. None of the rami are here long and acute as represented by Claus and Spence Bate for the young of the species which they describe.

Telson almost circular, reaching a little beyond the peduncles of the third uropods.

Length.—About a fifteenth of an inch.

Platyscelus serratulus, n. n.

1879. *Eutyphis serratus*, Claus, Die Gattungen und Arten der Platysceliden, p. 11.
1887. „ „ Claus, Die Platysceliden, p. 37, Taf. iii. figs. 5–14.

The rostral angle produced, the segments imbricated.

Lower Antennæ, of the male, with the second joint of the flagellum rather longer than the first.

Epistome, as in the other species, forming a shallow dome, much broader than deep.

Maxillipeds.—The outer plates very broad, the inner plate having two little embedded spinules below the centre of the distal margin.

First and Second Peræopods.—Third joint not very elongate, not much longer than the fourth, the gland-cells not conspicuous; fourth joint not much longer than the fifth.

Third Peræopods.—The third joint slightly longer than the fourth.

Fourth Peræopods.—The first joint has a much longer slit on the outer surface than is found in *Platyscelus armatus* or *Platyscelus rissoinæ*.

Localities.—April 28, 1876; North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night; surface temperature, 73°. One specimen.

Station 348, April 9, 1876; North Atlantic; lat. 3° 10′ N., long. 14° 51′ W.; surface to 200 fathoms; surface temperature, 84°. Four specimens, the largest, a male, under one-fifth of an inch long; in this specimen the fifth peræopods have a minute tubercular second joint, and no third joint; as in the specimen last mentioned the telson is distally more narrowed than in Claus' figure.

Station 106, August 25, 1873; between St. Vincent and St. Paul's Rocks; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms; surface temperature, 78°·8. One specimen, female, a fifth of an inch long. In the fifth peræopods there are two small terminal joints, the end one longer and thinner than the penultimate.

Station 108, August 27, 1873; off St. Paul's Rocks; lat. 1° 10′ N., long. 28° 23′ W.; surface; surface temperature, 78°. One specimen.

Remarks.—Claus, who identifies *Platyscelus serratus*, Spence Bate, with *Typhis ovoides*, Risso, himself establishes a new species with the name *Eutyphis serratus;* as the generic name *Platyscelus* is here allowed its right of priority, an alteration is at the

same time required of the preoccupied specific name. Bovallius, in his Systematical List of the Hyperina, does not mention Claus' *Eutyphis serratus*, perhaps considering it to be the same with *Typhis ferus*, Milne-Edwards, 1830, figured in the Annales des Sciences naturelles, t. xx. pl. xi. figs. 8–18. If those figures, however, may be trusted, the present species, though agreeing in respect of the lower antennæ of the male and in various other points, differs in several particulars; in the first gnathopods the process of the wrist, which is pectinately toothed along both margins, at its base is closely adjacent to the hand, not separated from it by a space; in the second gnathopods the third joint is more out-bowed in front, and the wrist has the distal process as long as the proximal part; the third joint of the first peræopods is of less proportional length; and whereas in Milne-Edwards' figure the rami of the third uropods are subequal, the inner if anything the shorter, in Claus' species the outer ramus is much shorter and narrower than the inner, which is only feebly jointed to the peduncle, if not coalesced with it; the telson is also broader at the base than the length in Claus' species, but the reverse in Milne-Edwards'. In the Challenger specimen the apex of the telson is a little narrowed, not broadly rounded as in Claus' figure.

Genus *Hemityphis*, Claus, 1879.

1879. *Hemityphis*, Claus, Die Gattungen und Arten der Platysceliden, pp. 4, 12.
1886. ,, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 482.
1887. *Dithyrus*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 46.
1887. *Hemityphis*, Claus, Die Platysceliden, pp. 31, 38.

For Claus' definition of *Hemityphis*, see Note on Claus, 1879 (p. 491). The points by which Claus distinguishes *Eutyphis* from *Hemityphis* are simply, that in *Eutyphis* (*Platyscelus*) the two terminal joints of the hinder-male antennæ are very short, and the outer plates of the maxillipeds are slightly concave on the inner margin, while in *Hemityphis* the two terminal joints of the hinder male antennæ are long (though notably shorter than the two preceding joints), and the inner margins in the maxillipeds are deeply concave.

Bovallius in 1887 identifies *Hemityphis* with *Dithyrus*, Dana, but without giving his reasons. Claus has pointed out that Dana established his genus *Dithyrus* on a damaged specimen of the female sex, and suggests that the type species, *Dithyrus faba*, may be the same as his own *Eutyphis inermis*. Dana's figures and descriptions do not in fact supply the means of deciding whether he was dealing with a species of *Platyscelus* or *Hemityphis*. The figure, which he gives as representing *either* the first *or* the second peræopod, by the straight downward-pointed finger is rather in agreement with *Hemityphis* than with *Platyscelus*, but on so minute a detail it is impossible to lay much stress, where it has not been observed for a special purpose. According to Dana

the first peræopod in his species is a little longer than the second, whereas both in *Platyscelus* and *Hemityphis* the reverse is the case; this would tend to show either that Dana's genus is different from both those mentioned, or that no extreme weight is to be given to his accuracy in minutiæ. The long peræon shown in the full figure of *Dithyrus faba* is more like that of a species of *Platyscelus* than it is to those hitherto figured of *Hemityphis*, and, in the absence of other evidence, it seems just that *Hemityphis*, Claus, which can be perfectly well recognised, should hold its place, and that the name, *Dithyrus*, Dana, should stand aside until some species has been found to correspond with Dana's definition.

Hemityphis tenuimanus, Claus (Pl. CLXXXIII.).

1879. *Hemityphis tenuimanus*, Claus, Die Gattungen und Arten der Platysceliden, p. 12.
1887. *Dithyrus tenuimanus*, Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 46.
1887. *Hemityphis tenuimanus*, Claus, Die Platysceliden, p. 38, Taf. iv. figs. 1–13.

The Head broad, sloping a little downwards and forwards, the rostral angle not projecting but folded underneath; the peræon with evenly convex sides as viewed from above, all the seven segments very short, so that all of them together at the centre of the back do not equal the length of the head or one-third the length of the pleon; on the other hand the greatest width of the animal is at the centre of the peræon; the first three segments of the pleon are long, the first about as broad as the head, the two following successively narrower; the sides are carinate, the hind borders below the carina being emarginate; the fourth segment is much shorter but not much narrower than the third; the fifth and sixth segments and the telson are coalesced, forming a triangular piece, of which the sides are a little convex near the base, slightly interrupted at the insertion of the third uropods, but otherwise converging in a nearly straight course to the narrowly rounded apex.

Eyes large, leaving the front of the head and a small triangular space behind free, the lower division of the eye much smaller than the upper, not projecting so far forward, and with smaller ocelli.

Upper Antennæ placed very close together on either side of the rostral point, and projecting very slightly beyond the head; first joint of the peduncle cylindrical, rather longer than broad, second and third joints obscure or obsolete; first joint of the flagellum much longer than the peduncle, bent abruptly at right angles to it, fringed on the inner side with a great number of rows of filaments, set so closely as to make a thick brush which streams out beyond the succeeding joints; the distal end of the joint is itself a little produced on the inner side, with a rounded apex; the next joint is very small, about twice as long as broad, carrying several filaments, and reaching a little

beyond the apex of the preceding joint; the succeeding joint is about half as long and broad, with two or three apical filaments, and followed by a minute terminal joint.

Lower Antennæ (in the male).—The third (first free) joint of the peduncle moderately thick and long, slightly curved, narrowing distally; the fourth joint very slender, very much longer than the preceding, thickening distally; the fifth joint similar to the fourth, subequal in length, less thickened distally; the first joint of the flagellum is longer than the third joint of the peduncle, thinner than the fifth, and about two-thirds of its length; the second joint of the flagellum is almost as thick and long as the first.

Mandibles.—The small cutting edge has an oblique finely dentate margin, that of the one mandible more oblique than that of the other; the secondary plates similar to the primary, but not quite so large; the palp is set far back, with the first joint longer than the second or third, but not equal to both together, the third is about equal in length to the second, but narrower.

First Maxillæ with three little teeth close-set on the inner margin near the apex.

Second Maxillæ broader than the first, with narrow apex.

Maxillipeds.—The inner plate is very short, rather broad; the outer plates are broad, the outer margins very convex, the inner sinuous; the apices narrowly rounded.

First Gnathopods.—Side-plates small, the lower front corner forming a somewhat acute angle, nearly bisected by a ridge on the under side. The first joint reaching much beyond the side-plate, widening till near the distal end, then narrowing, the front margin convex, carrying a few setules, the hind margin more convex than the front, with a setule a little above the apex; the second joint short, with one or two setules on the hind margin; the third joint longer than the second, distally widened, with three setules on the lower half of the front margin, and one at the apex of the hinder; the wrist not wider than the third joint, but longer even without the triangular process at the end of the slightly sinuous, finely denticulate, hind margin; the narrow, curved, somewhat tapering hand is longer than the front, but shorter than the hind, margin of the wrist, less than twice the length of the process, its front margin convex, its hinder slightly concave, and like the margin of the process which faces it scarcely denticulate; the finger is very short and slender, less than a third of the length of the hand.

Second Gnathopods.—The side-plates with the lower front corner rounded. The branchial vesicles large, of very thin texture. The first joint rather longer than in the preceding pair, with the front margin concave except at the two ends, the hind margin very convex; the other joints are nearly as in the first gnathopods, but the third joint is a little longer and narrower, with several setules along the hind margin, the wrist has the front margin shorter, the hind margin longer and straighter, with two or three setules on the proximal half, and forming a longer process, serrate on both edges. In the first joint there are gland-cells, in both pairs of gnathopods.

First Peræopods.—The side-plates similar to the preceding pair. The branchial

vesicles of great size. The first joint very similar in shape to that in the second gnathopods, but with the muscles more strongly developed, the greatest breadth some distance above the distal end, the sides smooth; the second joint longer than broad; the third joint longer than the fourth or fifth, widest not far from the base, the front margin convex, the hinder slightly concave; the fourth joint a little curved, wider than the fifth, but scarcely so long; the fifth having some fine denticulation at the hinder apex; the finger curved, very short and thin, at the base narrower than the fifth joint, and almost immediately abruptly narrowing.

Second Peræopods very similar to the first, but with the second, third, fourth, and fifth joints considerably longer.

Third Peræopods.—Side-plates deeper behind than in front, with a strong triangular tooth on the inner side at about the middle of the lower part, directed backwards. Branchial vesicles not so large as the first joint. The first joint more than twice as long as broad, the hind margin evenly convex, the front sinuous, the chief concavity being below the centre, the distal part curling round below the second joint; the plate is narrowest at the two extremities, having its greatest width near the centre; the remaining joints folded back against its inner surface do not reach the top; the second is short, the third longer than the fourth, the fifth longer than either, having its convex hind margin produced into a minute spike; the front margin is minutely pectinate in the third, fourth, and fifth joints; the finger is rather longer than in the preceding feet, with the hind margin a little jagged.

Fourth Peræopods.—The side-plates with the hind margin longer than the front, the two nearly parallel. The branchial vesicles broad, not nearly so long as the first joint. The first joint larger than in the preceding pair, the lower part a little narrower than the upper, the upper part of the hind margin strongly convex, the lower half where the margin is double nearly straight; near the lower end of the convex part there is a very small slit on the outer surface; the front margin is for the most part concave, the lower margin slightly oblique, rounded in front; a strip along the front and lower margins has a striated appearance, observable also round much of the border of the first joint in the third peræopods; the remaining joints together equal about one-third the length of the first; the second joint short, attached some way up and within the hind margin of the first; the third joint very long, the front margin a little longer than the hinder, forming a small apical triangle, and strongly pectinate almost from the base to the tip; the fourth joint narrower than the third and little more than half its length, similarly pectinate, narrowing distally; the fifth joint, which is the last, slender, acute, more than half the length of the fourth, finger-like.

Fifth Peræopods.—Side-plates small, triangular, deeper than broad, the apex not reaching nearly as far as the lower border of the preceding pair. The limb consisting of a single joint, laminar, almost crescent-like, bending across the top of the preceding limb

on the inner side; there is a small incision just above the apex of the convex hind margin, followed by a little rounded lobe, as if a second joint had been thought of, and the intention abandoned; the front margin is concave except where it curves round to this lobe.

Pleopods.—The peduncles strong, with a deep lobe at the inner end of the lower margin; the two coupling spines small, with circular heads, the rims of which are denticulate; the cleft spine short and strong, the arms subequal; the joints of the rami numbering ten or eleven on the inner, eleven or twelve on the outer.

Uropods.—The peduncles of the first pair widening distally, very slightly longer than the rami, pectinate on the outer margin and outer half of the lower margin; the outer ramus long oval, but with apex somewhat angular, the outer margin and lower part of the inner pectinate; the inner slightly shorter and narrower, being flattened on its outer side, almost smooth; the peduncles of the second pair starting almost from the same point as the preceding but scarcely half their length; the outer ramus elongate oval, narrow, and almost pointed at each end; the inner ramus longer than the outer or than any of the other rami, widening distally, and ending in an obtuse angle; the peduncles of the third pair very small, attached below the middle of the composite segment, at the point where the part of it belonging to the telson may be supposed to begin; the rami nearly like those of the second pair, but considerably smaller, and the inner having its outer side the straighter; this ramus reaches just beyond the telson, while the outer ramus just reaches beyond the inner ramus of the first pair, but not so far as the outer ramus of that pair.

The Telson has been already described.

Length of the specimen figured in lateral view three-tenths of an inch; length of specimen A. a quarter of an inch. Both males.

Locality.—March 15, 1874, 100 miles South of Australia; lat. 39° 45′ S., long. 140° 40′ E.; surface; surface temperature, 60°·2. Nine specimens. In these specimens the shortness of the peræon, especially dorsally, and a somewhat more depressed habit of body, with greater obliquity of the head, induced me for a long time to place them under a separate specific name.

March 16, 1874, 50 miles south of Australia; lat. 39° 22′ S., long. 142° 27′ E.; surface; surface temperature, 61°. Six specimens.

April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night; surface temperature, 73°. Seven specimens, shorter and stouter than those from the waters south of Australia.

From this same locality there were also obtained thirteen specimens probably belonging to this species, but in a damaged condition, twelve of them having entirely lost the third and fourth peræopods.

Genus *Paratyphis*, Claus, 1879.

1879. *Paratyphis*, Claus, Die Gattungen und Arten der Platysceliden, pp. 4, 13.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 483.
1887. *Paratyphes*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 47.
1887. *Paratyphis*, Claus, Die Platysceliden, pp. 31, 39.

For the original definition of the genus, see Note on Claus, 1879 (p. 491). Some modification will be required for the inclusion of the species "*Paratyphes Théeli*" added to the genus by Bovallius, for in that species "the short and weak chela-process of the wrist," mentioned by Claus, is wanting to the second gnathopods, and the side-plates of the third peræopods are without inner tooth-process. The new species, *Paratyphis promontorii*, is also without any process of the wrist in the second gnathopods.

For distinguishing the genus from the other genera of the family Typhidæ, Claus gives the characters:—

"The *First Gnathopods* without, the *Second* with quite rudimentary, chela. The two terminal joints of the hinder male antennæ of moderate length."

Paratyphis promontorii, n. sp.

In general form agreeing with *Paratyphis maculatus*, Claus.

Upper Antennæ.—The peduncle and first two joints of the flagellum as in the species just mentioned, the two terminal joints missing.

Lower Antennæ.—Third (first free) joint of the peduncle curved at the base, about half as long as the following joint, which is rather longer than the fifth; the first joint of the flagellum is more than half as long as the last of the peduncle, and the following joint about as long as the third joint of the peduncle.

Upper Lip forming an arched dome.

Mandibles.—The trunk tolerably broad behind the palp, in front of it long and narrow, with nearly straight upper and sinuous under margin; the upper margin is continuous with the projecting tooth of the cutting edge, which is divided into about twenty minute denticles; on the left mandible there is a secondary plate, similar to the principal but rather smaller; the first joint of the palp is the longest and broadest, but not so long as the two following together; the third joint is longer than the second, slightly curved, not acute.

First Maxillæ.—The four teeth near the top of the inner margin are very small; the apex of the plate is narrowly rounded.

Second Maxillæ.—In these the apex appears to be acute.

Maxillipeds.—The inner plate broader at the base than the length, with two little embedded spinules at the centre of the slightly convex broad distal margin; the outer

plates broad, their inner margins almost meeting; there are a few little setules on the surface.

First Gnathopods.—The side-plates with the lower front angle acute. The first joint long and straight, longer than the remaining joints together, with gland-cells; the second joint a little longer than broad, with a slender spine on the hind margin; the third joint shorter but rather broader than the fourth, with a slender spine above the apex of the convex front margin, and three such spines on the hind margin; the wrist similarly armed and having also two or three surface-spinules; the hind margin is straight, seemingly a little pectinate, the front margin scarcely convex, so that the joint is of nearly uniform breadth throughout, and projects a little on either side of the hand, which is much narrower and shorter, tapering, armed with a few hairs; the finger straight, acute, about a quarter of the length of the hand.

Second Gnathopods very similar to the first, but the first joint is longer and somewhat curved; the third joint is rather longer than the wrist, which is a little broader but not longer than that of the first pair, with more spines along the hind margin; the apex is not in the least produced; the hand is a little larger than in the first gnathopods but of the same shape.

First Peræopods much longer than the gnathopods; the first and second joints very like those of the second gnathopods but rather stronger; the third joint rather elongate, slightly curved, longer than the fourth, having two spinules at the upper and one at the lower part of the concave hinder margin; the fourth joint longer than the fifth, slightly curved; the fifth joint distally narrowed, having a few setules and some very minute pectination along the almost straight hind margin; finger slender, about a third or a fourth the length of the fifth joint, a little bent.

Second Peræopods similar to the first, but with the joints more elongate except the finger.

Third Peræopods.—Side-plates not broader than deep, the lower hinder angle much rounded, the inner process not very large, a little bent, directed more downwards than backwards. The first joint elongate, much more than twice as long as the greatest breadth, longer than all the other joints together, the hind margin not very strongly convex, the front sinuous, produced in a rounded point a little below the hind margin; the short second joint lying across the narrow hinder part of the distal margin of the first joint; the third joint long, narrow, straight; the fourth equal to the third in length; the fifth rather shorter than the fourth, a little curved, and like the two preceding joints with insignificant armature; the finger small, acute, not a fifth the length of the preceding joint.

Fourth Peræopods.—The first joint longer and broader than that of the preceding pair, the front margin concave, the upper part of the hind margin very convex, below this the joint narrows, with straight hind margin nearly parallel to the front but not

reaching so low; the longitudinal groove as described in the account of the genus; the second joint is short and bent, not reaching the hind margin, below the middle of the straight part of which it is placed; the remaining joints are just long enough to reach the top of the straight part; the third joint longer than the following joints together, pectinate, with backward turned teeth along the front margin, the apex of which is acutely triangular, produced to about a third of the length of the following joint; fourth joint much narrower than the third, with smaller teeth along the front and no produced apex; the fifth joint finger-like, about half the length and breadth of the fourth, the front margin straight, having a decurrent setule which does not reach quite to the acute apex, the hind margin convex.

Fifth Peræopods.—Side-plates triangular. The limb very thin in texture and transparent; the first joint curved, narrow at the base and still more narrow at the apex, the hind margin strongly convex till close to the apex, the front margin less strongly concave; the minute second joint not longer than broad; the third joint long and narrow, almost straight, a little clubbed at the end, this filiform appendage being bent back against the first joint, and equalling nearly a quarter of its length.

Pleopods.—Joints of the rami eight to nine in number.

Uropods.—Peduncles of the first pair curving inwards, strongly pectinate on the outer margin and outer apex, about as long as the rami, which are nearly equal, the inner slightly the longer, in each the outer margin closely pectinate, the inner margin except near the base slightly serrate; peduncles of the second pair about half the length of those of the first, the outer ramus shorter than the inner, with the margins nearly smooth; peduncles of the third pair very little longer than broad, the outer ramus much narrower than the inner, more than three-quarters of its length, smooth; the inner ramus coalesced with the peduncle, reaching beyond that of the first pair and to the end of the telson, almost smooth.

The Telson triangular, broader at the base than the length, with well-rounded apex, its sides almost continuous with the strongly converging sides of the preceding segment.

Length, about one-fifth of an inch.

Locality.—Station 142, December 18, 1873; off the Cape of Good Hope; lat. 35° 4′ S., long. 18° 37′ E.; surface; surface temperature, 65°·5. One specimen, male.

Remarks.—The specific name alludes to the taking of the species near the Cape of Good Hope. I should have been inclined to identify it with *Paratyphis théeli*, Bovallius, but that, in his brief description of that species, Bovallius expressly says—"Epimeral of fifth pair [third peræopods] without spinous process." From Claus' species, *Paratyphis maculatus* and *Paratyphis parvus*, it is distinguished by the wrist of the second gnathopods, the fifth peræopods and the third uropods. A specimen, however, which in most respects bears a close resemblance to that above described, has only a

minute rudiment of a second joint on the fifth peræopods. The specimen in question was labelled "October 5, 1873. South Atlantic, surface, night"; that is, in lat. 29° 1′ S., long. 28° 59′ W.; surface temperature, 65°·2. In the lower antennæ it has the first joint of the flagellum scarcely half as long as the last of the peduncle, and the second joint almost as long as the first. It may perhaps represent a distinct species, or it may indicate that parts of the animal are very variable, and that some of the species already established should be united.

Paratyphis pacificus, n. sp.

Head with triangular point below; peræon-segments very short.

Lower Antennæ.—First joint of the flagellum more than half as long as the last of the peduncle, second joint five-sixths of the length of the first.

Maxillipeds short and broad.

First Gnathopods nearly as in *Paratyphis promontorii*, but the lower front angle of the side-plates more acute, the hand nearly as long as the wrist, and the finger more than a third the length of the hand.

Second Gnathopods.—The wrist rather longer than the third joint, with few spines, the hind margin outdrawn into a little pectinate apex; the hand rather longer than the wrist.

First Peræopods.—The first joint sinuous, the third not longer than the fourth.

Second Peræopods like the first, but considerably longer.

Third Peræopods.—The side-plates with a very short, blunt, striated process on the inner side. The fourth joint finely pectinate on the front margin, a little shorter than the third; the fifth joint longer than the third, with a small spinule or tooth at the apex of the slightly convex hind margin; the finger slender, slightly bent, not a quarter the length of the fifth joint.

Fourth Peræopods.—The slit on the outer surface of the first joint is shorter than in *Paratyphis promontorii*, and the third joint has the produced apex blunter, this and the two following joints being shorter than in the species just named.

Fifth Peræopods.—First joint very thin in texture and transparent, very narrow at both extremities, curved; the second and third joints quite minute, the second almost coalesced with the first.

Pleopods.—Peduncles produced on the inner side; coupling spines minute; the cleft spine with a very slight subapical dilatation of the longer arm; the joints of the rami from seven to nine in number.

Uropods.—Peduncles of the first pair pectinate along the outer margin and its apex, about equal in length to the rami, which are equal, reaching nearly to the end of the telson, the outer with strongly pectinate outer margin, the inner with the lower

part only of that margin pectinate and not strongly, the inner margin only slightly serrate; the second pair as in *Paratyphis promontorii;* the third pair with the outer ramus less than half the breadth, but a little more than half the length of the inner, the margins of each being very minutely pectinate; the inner ramus reaches a little beyond the telson.

The Telson as in the species just mentioned, but with much narrower apex, the sides straighter and converging more rapidly.

Length, less than a fifth of an inch.

Locality.—August 24, 1875; 400 miles south of Hawai; lat. 13° 1′ N., long. 151° 50′ W.; surface at night; surface temperature, 78°·2.

Remark.—The specific name refers to the capture of the species in the Mid Pacific Ocean. From *Paratyphis parvus*, Claus, it is distinguished by the produced apex of the third joint in the fourth peræopods, the two- to three-jointed fifth peræopods, and the longer outer ramus of the third uropods, but the species bear a close resemblance to one another.

Genus *Tetrathyrus*, Claus, 1879.

1879. *Tetrathyrus*, Claus, Die Gattungen und Arten der Platysceliden, pp. 4, 14.
1886. ,, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 483.
1887. ,, Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 47.
1887. ,, Claus, Die Platysceliden, pp. 31, 40.

For the definition in the original language, see Note on Claus, 1879 (p. 491).

In the preliminary table of the family Typhidæ, Claus gives as the character common to *Tetrathyrus* and *Amphithyrus*:—

"Both pairs of gnathopods subchelate. The two terminal joints of the hinder antennæ in the male as long or nearly as long as the preceding."

To distinguish *Tetrathyrus* from the companion genus he gives the characters:—

"Gnathopods simply subchelate. Laminar first joint of the fourth peræopods without pocket-shaped groove."

Tetrathyrus moncœuri, n. sp. (Pl. CLXXXIV.).

Dorsal surface of the head with a downward slope, the rostral triangle bent in and tip-tilted; the back broadly rounded; first two segments of the peræon very short dorsally, especially the second; the first three segments of the pleon conspicuously larger than any of the peræon-segments.

Eyes divided as in *Tetrathyrus forcipatus*, leaving free a narrow strip at the base of the head, another along its centre, and a space over the rostrum.

Upper Antennæ.—The first joint of the peduncle cylindrical, the following joint almost evanescent; the first joint of the flagellum large, the upper margin short, with a tuft of filaments at the apex, the lower margin very long and convex, this part being lined with the thick brush of long filaments and produced into a rounded apex along half the second joint; the third joint is much thinner than the second, but scarcely shorter, armed like it with a tuft of filaments; the fourth joint linear, a little longer than the third, with setules at the apex.

Lower Antennæ.—Gland-cone conspicuous; third joint of the peduncle thick, scarcely curved, about a third as long as the much thinner fourth joint, which is straight, distally widened; the fifth joint slightly longer than the fourth; the first joint of the flagellum thinner than the last of the peduncle and a little shorter, the terminal joint very slender, more than three-quarters of the length of the preceding joint.

Mandibles.—The trunk tolerably straight, very narrow, the striate cutting edge forming an acute angle with the upper margin, the secondary plate of the left mandible similar to the principal plate but smaller; the first joint of the palp broader and longer than the second, the second curved, making an angle with the first, the third a little sinuous, tapering, longer than the first, making an angle with the second.

First Maxillæ slender, apically pointed.

Second Maxillæ seemingly represented by a pair of broad smooth plates, which are apically narrowed.

Maxillipeds.—The broad outer plates have the outer margins somewhat folded in, and the inner margins overlapping, the distal portion of each plate carrying a couple of setules.

First Gnathopods.—The first joint distally widened, the second not longer than broad, the third distally widened, longer than the wrist, the margins carrying some small spinules; the wrist broader and rather longer than the hand, with spinules on the hind margin; the hand oblong, a little curved, the slightly concave hind margin a little apically produced; the finger small, with dilated base, the curved tip when the finger is closed down reaching beyond the narrow concave two-rimmed palmar margin, which has three or four little setules on it or adjacent to it.

Second Gnathopods.—The branchial vesicles large and oval as in the following pairs, much broader than the first joint. The first joint longer than in the first pair, proximally narrow and bent, with spinules along much of the sinuous front margin; the remaining joints nearly as in the first gnathopods, but the hand having the hinder apex a little more produced.

First Peræopods much longer than the gnathopods; the first joint similar in shape to that of the second gnathopods, the second joint longer than broad, the third broader and

a little longer than the fourth, both rather slender and curved, the fifth shorter than the fourth ; the finger minute.

Second Peræopods similar to the first, but with the third and fourth joints decidedly longer.

Third Peræopods.—The side-plates with a small process on the inner side, forming a blunt triangle. The first joint larger than the branchial vesicles, about as long as the third, fourth and fifth joints together, an oval narrower at the basal than the distal end, and with the front margin flattened, this being a little serrate at the lower end, the whole border fringed with more or less distant setules ; the second joint not reaching the lower margin of the first, the third like the two following, carrying some spinules along the front margin, broader than the fourth, but scarcely so long ; the fourth joint curved, longer than the fifth ; the finger minute.

Fourth Peræopods.—Side-plates having on the inner side a process which is a little produced over the first joint in a thin lamina rounded in front, while behind a small hook-like piece connects the process with the side-plate. The first joint large, continuously broad, the front margin concave to fit the convex hind margin of the much smaller first joint of the preceding pair, the hind margin convex from the base for nearly half the length, the remainder straight, the parallel inner edge beginning above the end of the convex part, the lower part fringed with a few setules ; the remaining joints together about half the length of the first, the second not reaching either its hinder or its lower margin ; the third joint longer than the three following together, a little produced at the front apex, its front margin pectinate ; the fourth joint longer and much broader than the fifth, its front margin pectinate ; the fifth joint narrowly oval, with decurrently pectinate front margin, the pectination minute ; the finger curved, minute.

Fifth Peræopods very small and feeble ; the first joint scarcely longer than that of the first gnathopods but broader, the front margin almost straight, the hinder convex ; the remaining joints minute, together not nearly half the length of the first, their length united scarcely exceeding its breadth, the third joint longer and broader than the fourth, the fourth than the fifth.

Pleopods.—Peduncles stout, produced downwards at the rounded inner angle ; the coupling spines short, the rounded apices forming three or four retroverted teeth ; the cleft spine with a very narrow subapical dilatation of the shorter arm ; the joints of the rami nine or ten in number.

Uropods.—Peduncles of the first pair about as long as the outer ramus, with some submarginal setules and the lower part of the outer margin pectinate ; the outer ramus shorter and narrower than the inner, both with the margins finely pectinate and the apex very acute ; peduncles of the second pair shorter than the outer ramus ; the rami as in the preceding pair, but respectively shorter, and the outer margin of the outer ramus

smooth except for one or two indents; peduncles of the third pair longer than the outer ramus, a little shorter than the inner, which is distinguished from the peduncle by an indent on the inner margin and a suture of the under surface; the rami ornamented like the preceding pair, but respectively much smaller.

Telson coalesced with the preceding segment, though the lateral margins of the two are not continuous; the breadth of the telson at what seems to be its proper base being less than the length; the apex narrow, somewhat rounded, not reaching so far as the apex of the inner rami of the third or of the first uropods; there are a few little setules about the apex and two or three on each lateral margin.

Length.—One-fifth of an inch.

Localities.—Station 162, April 2, 1874; off East Moncœur Island, Bass Strait; lat. 39° 10′ 30″ S., long. 146° 37′ 0″ E.; surface; surface temperature, 63°·2. Several specimens.

Station 164A, June 13, 1874; east of Australia; lat. 34° 9′ S., long. 151° 55′ E.; surface to 50 fathoms; surface temperature, 70°·2. One specimen.

Remarks.—The specific name refers to the place of capture. In *Tetrathyrus rectangularis*, Bovallius, from the Indian Ocean, the last joint of the lower antennæ is less than half as long as the preceding joint, the finger in the gnathopods is more than a third of the length of the hand, and the fourth peræopods are said to be without finger.

Tetrathyrus arafuræ, n. sp.

In general appearance and in respect to the antennæ and mouth organs so far as examined this species agrees substantially with *Tetrathyrus moncœuri*.

First Gnathopods.—The third joint much wider than the wrist, so as to project beyond it both before and behind, having one spinule at the flattened apex of the front margin and four spinules on the hind margin; the wrist oval, the front margin smooth, the hinder with four spinules.

Second Gnathopods.—The third joint much longer as well as broader than the wrist, with two spinules on the front apex and seven along the hinder margin and its apex; the wrist also with seven spinules along its convex hind margin.

First and Second Peræopods very long and slender, more conspicuously so than in the other two species here described.

Third Peræopods.—First joint a long oval, nearly equal in length to all the remaining joints together, the front margin sinuous with some minute spinules, the smoothly convex hind margin interrupted just before the broad apex of the joint is reached, the short second joint partially overlapping the small emargination thus formed; the third joint about as long as the fifth, much shorter than the fourth.

Fourth Peræopods.—The large first joint more than twice as long as the remaining joints together; the third joint much longer than the three following joints together pectinate along the front margin with retroverted teeth, the apex produced half way along the fourth joint; the somewhat crooked finger is nearly half the length of the fifth joint.

Fifth Peræopods.—The first joint transparent, two or three times as long as broad, a little curved, the apex divided, the hinder division produced a little below the front. There is no trace of any other joints.

Uropods.—Peduncles of the third pair much shorter than the rami; the outer ramus nearly equal in length to the inner, its outer margin nearly smooth, the inner finely pectinate; the inner ramus quite distinct from the peduncle, much of each margin finely pectinate.

Telson coalesced with the preceding segment, longer than broad, triangular, the narrowly rounded apex extending just beyond the apices of the third uropods, the sides slightly concave above and below.

Length about one-fifth of an inch when fully extended.

Locality.—September 13, 1874, Arafura Sea; lat. 8° 18′ S., long. 135° 7′ E.; surface; surface temperature, 79°. Three specimens, two of them, perhaps all three, males.

Remark.—The specific name is taken from the place of capture.

Tetrathyrus forcipatus, Claus.

1879. *Tetrathyrus forcipatus*, Claus, Die Gattungen und Arten der Platysceliden, p. 14
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 47.
1887. „ „ Claus, Die Platysceliden, p. 40, Taf. v. figs. 10–18, Taf. vi. figs. 1–3.

The rostral triangle conspicuously produced, the lower margin of the head forming an acute angle on either side of it.

Eyes.—One division large, with large pigment, this pair occupying almost all the sides and top of the head; the other division very small, with small radiating ocelli, not set closely together, this pair placed in the front of the head on either side of the rostral triangle.

Fourth Peræopods.—The third joint with its front apex more produced, and produced more sharply than in *Tetrathyrus moncœuri*, this and the two following joints being relatively narrower and shorter than in that species, but similarly pectinate, the finger small.

Fifth Peræopods.—The first joint drawn out to a very narrow apex, perhaps tipped with a minute second joint.

Telson reaching as far as or a little beyond the apex of the inner ramus of the third uropods, the apex without setules.

Localities.—April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night; surface temperature, 73°. One specimen, male.

April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface; surface temperature, 74°. Four specimens.

Remark.—A specimen of this species has been sent me by Dr. Bruce from Malta.

Genus *Amphithyrus*, Claus, 1879.

1879. *Amphithyrus*, Claus, Die Gattungen und Arten der Platysceliden, p. 15.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 483.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 48.
1887. „ Claus, Die Platysceliden, pp. 31, 41.

For the original definition of the genus, see Note on Claus, 1879 (p. 491). In the preliminary table of the family Typhidæ, Claus gives as the character common to *Tetrathyrus* and *Amphithyrus* :—

"Both pairs of gnathopods subchelate. The two terminal joints of the hinder antennæ in the male as long or nearly as long as the preceding."

To distinguish *Amphithyrus* from the companion genus he gives the characters :—

"Gnathopods doubly and complexly subchelate. The laminar first joint of the sixth pair of legs [*Fourth Peræopods*] with large pocket-shaped groove."

Amphithyrus orientalis, n. sp.

For the appearance of this species both in general form, and with certain exceptions also in detail, I may refer to the figures given by Claus in Die Platysceliden, Taf. vii., of his species *Amphithyrus sculpturatus* from the Atlantic Ocean. It is also in general shape like *Parascelus zebu* of this Report. The head is a little produced below; the postero-lateral angles of the first three pleon-segments are not acute, and the fourth pleon-segment has a well-marked dorsal depression.

Upper Antennæ.—First joint of the peduncle widening distally, second and third joints very short, scarcely distinct in parts of the circumference; first joint of flagellum large, strongly bent, with a large brush of long filaments fringing the long convex margin and passing right round the produced rounded apex; the second joint not reaching beyond the apex of the first, tapering distally, its outer margin convex, carrying five groups of broad filaments; the third joint not longer than the second, much more slender, with two groups of long filaments on the outer margin; the fourth joint slender, spiniform.

Lower Antennæ.—Third (first free) joint of the peduncle short, pyriform, greatly dilated near the base, smooth-edged; the following joints elongate, ciliated, the fourth joint being scarcely as long as the fifth; the first joint of the flagellum is narrower than the last of the peduncle, but only a little shorter, and the second joint is more than three-quarters the length of the first, the terminal filaments being longer than those on the margin.

The Mouth Organs appear to a great extent to coincide with those which Claus figures for *Amphithyrus bispinosus*. The palp of the *Mandibles* is long, the first joint the broadest, long, but a little exceeded in length by the second, the third joint being narrower than the second but as long, with a rounded not an acute tip. The trunk of the *First Maxillæ* is of uniform breadth for some distance, but narrows towards the apex by the inner margin turning obliquely outwards, this inner margin being armed near the apex by two somewhat curved retroverted teeth; the *Maxillipeds* have the inner plate broadly rounded, the distal border smooth, with two embedded spinules at the centre, the outer plate broad, partly folding round the inner and reaching not very far beyond it.

First Gnathopods.—The side-plates a little produced forwards at the rounded lower angle; as in many other species of the group the upper boundary of the side-plates is present, but very difficult to perceive, which may account for its omission in the figure of *Amphithyrus sculpturatus*. First joint about as long as the following four joints together, widened nearer to the apex than the base, the muscles running to about the middle of the joint; second joint a little longer than broad, with a setiform spine near the hinder apex; the third joint broad, rather longer than broad, the hinder apex acute, scarcely produced; the wrist as broad as the third joint, and with its acutely produced hinder apex equalling it in length, not as in *Amphithyrus sculpturatus* exceeding it; just within the acute tip of the triangular apex there is a little spinule; the hand is about as long as the wrist, but much narrower, the hind margin having a produced apex like that of the wrist but smaller, the front of the hand, however, being produced quite as far as the apex, so that there is a triangular cavity between them over which the small curved finger bends; the finger has a cilium on or near the inner margin. There are gland-cells observable in the first four joints, and in the second, third and fourth a series of minute ducts appear to connect these with the hind margin.

Second Gnathopods.—Side-plates deeper than wide, with convex front and concave hind margin. The branchial vesicles large, but not so large as those of the following limb. The first joint a little bent, longer than in the first gnathopods, longer than the rest of the limb; the second joint longer than broad, with four setiform spines on the hind margin; the third joint considerably broader and perhaps a little longer than the wrist, with four setiform spines along the hind margin, two or three others probably having been lost; the wrist, hand, and finger nearly as in the first gnathopods, but the process of the hand does not reach quite so far as the apex of the front; near the hind

margin of the wrist there are four little spinules on the surface. The gland-cells as in the first pair.

First Peræopods.—Side-plates, branchial vesicles, and first joint of the limb similar to those of the second gnathopods, but larger. Gland-cells conspicuous in the first and third joints; the second joint longer than broad; the third joint broader and longer than the fourth, its front margin very convex, the hinder smooth and almost straight; the fourth joint similar in shape; the fifth joint longer than the fourth, shorter than the third, slender, tapering, slightly curved, like the other joints quite smooth; the finger very small, curved, acute.

Second Peræopods similar to the first, but with the third, fourth, and fifth joints decidedly longer, and the hind margin of the fifth joint finely pectinate.

Third Peræopods.—The side-plates much narrower below than near the base, having a round-ended backwardly directed lobe projecting from the inner surface just above the attachment of the limb. The first joint large, elongate oval with flattened sides, subequal in length to the four following joints together, the front margin descending below the hinder one, the hexagonal markings very conspicuous over the whole surface both of this and the following joints; the second joint rather longer than broad, partly embedded in the distal end of the first joint; the third joint slightly shorter and stouter than the fourth; the fourth finely pectinate along the front margin and more conspicuously round the front part of the apical margin; the fifth joint straight, tapering, not longer than the third, with the front margin finely pectinate; finger missing.

Fourth Peræopods.—The side-plates deeper behind than in front, the front margin nearly straight, the hinder convex. The first joint larger than in the preceding pair, two or three times as long as the rest of the limb, the front margin convex near the base and at the lower corner, the long intermediate part nearly straight, the hind margin irregularly convex; facing the hind margin in its upper half is a longitudinal curved slit, the half of an oval in shape, with a transverse or oblique slit at either end; below this there is a hind margin of the inner surface running parallel to that of the outer, and below this an oblique sinuous fold of the inner surface a little above the rounded hinder apex; just above this fold is the short second joint, which with part of the next is covered by the first joint; the third is much longer than the three following joints together, the front margin to the end of the almost acute produced apex being pectinate with slightly retroverted teeth; the fourth joint which is narrower is similarly armed, and has the front margin rather longer than the hinder; the fifth joint is dwindled, attached at about the middle of the oblique apex of the preceding joint, not being a third either of the length or breadth of that joint; there is a minute curved blunt finger to correspond.

Fifth Peræopods.—No upper boundary of the side-plates could be perceived. The first joint long, slender, curved, narrowest at either extremity, four or five times as long as all the feeble remaining joints together, the front margin concave, the hinder convex,

both smooth; third joint a little longer and broader than the second; fourth longer and narrower than the third; fifth oval, about as long as the third; finger apparently triangular, very sharp at the tip; all the joints of this limb but the first may be regarded as rudimentary.

Pleopods.—Peduncles stout, produced downwards at the inner angle; cleft spine with the arms subequal; inner ramus with six joints; outer with seven.

Uropods.—Peduncles of the first pair longer and broader than those of the second, but not reaching much beyond them, longer than the rami, the lower half of the outer margin pectinate; outer ramus longer than the inner, both acute, strongly pectinate on both margins; peduncles of the second pair scarcely as long as the outer ramus; the outer is the longer, very slightly toothed on the outer margin, strongly pectinate on the inner, as the inner ramus is on both margins; peduncles of the third pair short, the outer ramus much the shorter, with one or two teeth on the outer margin, the inner margin at first smooth and convex, then concave and strongly pectinate, the much broader inner ramus reaching beyond the telson, pectinate on both margins except near the base.

Telson narrower than the segment with which it is coalesced, about as long as broad, forming in outline an inverted arch, the apex acute. The hexagonal markings conspicuous all over it except just at the tip, where there are some very small submarginal setules; there is also some extremely minute marginal pectination.

Length, from front of the head to back of the second pleon-segment, one-fifth of an inch.

Locality.—July 1875, between Japan and Honolulu; lat. 35° N.; surface. One specimen, male.

Remarks.—The specific name explains itself. The differences are not very great between this eastern species and the western *Amphithyrus sculpturatus*. The sculpture is the same in both. In Claus' species, however, the first joint of the flagellum of the lower antennæ does not so nearly equal the last joint of the peduncle as in the Challenger species; in the second gnathopods Claus figures (though without describing)[1] on the front of the wrist a strong spine of which I here find no trace, while he does not indicate any armature of the thin margin of this and the two preceding joints; judging by his figures also the fifth and sixth joints in the fourth and in the fifth peræopods differ from the corresponding parts in the present species; in the third uropods he gives a more normal outline to the inner margin of the outer ramus, and the telson he figures as having the end broadly rounded, not as in the Challenger species pointed, his description of it being "telson broad and short, rounded off at the end."

[1] It may therefore be an accidental error in the engraving of the plate.

Amphithyrus sp.

Length.—One-tenth of an inch.

Locality.—September 13, 1874, Arafura Sea; lat. 8° 18′ S., long. 135° 7′ E.; surface; surface temperature, 79°. One specimen, male.

Remark.—I forbear to give a name to this interesting little species, as there is not time at my disposal to give an adequate description of it.

Amphithyrus bispinosus, Claus.

1879. *Amphithyrus bispinosus*, Claus, Die Gattungen und Arten der Platysceliden, p. 15.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 48.
1887. „ „ Claus, Die Platysceliden, p. 41, Taf. vi. figs. 4–16.

The Challenger specimen clearly and closely agrees with the description and figures of the species given by Claus. The species is well marked by the large laterally projecting spine-like process of the side-plates of the third peræopods. The side-plates, with the exception of those of the fifth peræopods, have their upper boundary distinct; the lower front angle in the first pair is directed a little forwards, and is almost acute; the postero-lateral angles of the first three pleon-segments are rounded. The sculpture of the integument, though in many parts showing hexagonal markings, in others takes the form of more or less parallel wavy lines.

The Eyes are separated by a central space which is broad over the acute point separating the upper antennæ.

The Lower Antennæ in this specimen are not tightly folded as in the fully adult male; the third (first free) joint of the peduncle is more or less pear-shaped; the next or fourth joint is more than twice as long, sinuous; the fifth is straighter and rather longer than the fourth, each having a subapical spinule, but being otherwise smooth-edged; the flagellum consists of one serpentine joint, longer than the last joint of the peduncle.

The Mouth Organs so far as observed were in agreement with Claus' figures; seen from below they exhibit a small *Epistome* occupying the space between the bases of the two mandibular palps; the upper margin is flat, the lateral margins convex, while the lower border shows a curved emargination, overarched by a much larger triangular depression of the surface. The mandibular palps in our specimen are sinuous, the joints undeveloped.

First Gnathopods.—First joint straight, widening a little distally, rather longer than the remainder of the limb; second joint with a spinule at the hinder apex; the three following joints subequal in length to one another, the wrist rather the longest by reason

of its sharply produced hinder apex, which has a notch with a cilium on the front or inner side; the hand has a similar but smaller process, the tip of which does not reach so far as the distal end of the front of the hand; the finger is small, strongly curved, with a cilium on the inner margin.

Second Gnathopods with all the joints larger than those of the first pair; the first joint considerably longer, bent; the second joint with a spinule or bristle a little above the hinder apex; the third joint distally widened, the hind margin very finely pectinate, with a bristle some way above the rounded apex; the wrist with three or four little setules on the surface near the somewhat sinuous finely pectinate hind margin, which is drawn out into an acute process reaching beyond the very small process of the hand, almost to its extremity; the hand about as long as the third joint, and about half its breadth.

First Peræopods.—First joint closely resembling that of the second gnathopods; second joint longer than broad; third about as long as the fourth, fifth longer than either, slender; finger slender, curved, about a quarter as long as the preceding joint.

Second Peræopods like the first, but with the fourth and fifth joints decidedly longer, the fourth longer than the third; the armature in both pairs of the slightest description.

Third Peræopods.—First joint an elongate oval, with flattened sides, not so long as the remaining joints together; the third joint scarcely longer than the fourth, but shorter than the fifth, these three having the front margin minutely pectinate; in the fourth joint the pectination is continued round the apical margin; the fifth joint is shorter than that of the second peræopods.

Fourth Peræopods.—The first joint very much larger than in the preceding pair, of irregular outline, broadest distally, with a large ear-shaped groove on the surface; the remaining joints by comparison insignificant, the second attached low down within the hind margin, the third about twice as long as the fourth, widening a little towards the slightly produced apex, pectinate along the front margin with nearly forty slightly retroverted teeth; the fourth joint similarly produced and pectinate with about a dozen strong teeth, besides some minute ones near the base; attached behind the obtuse front apex of the fourth joint is a rudimentary fifth joint with a little blunt rudimentary finger, the two together not reaching the end of the process of the fourth joint.

Fifth Peræopods feeble; the first joint slender, curved, having at the tip a little diminutive wrinkled representative of the following joints, which perhaps disappears at a later stage, as it is not indicated in Claus' figure.

Pleopods.—Peduncles produced downwards at the inner angle; the coupling spines minute, with an apical pair of hooks; cleft spine apparently with both arms to some extent dilated; inner ramus with five, outer with six, joints.

Uropods and acutely pointed *Telson* in close agreement with Claus' figures. The

inner ramus of the third pair of uropods is coalesced with the peduncle, as Claus figures it, though he does not mention the circumstance in his description. In *Amphithyrus sculpturatus* this ramus is free, and so also is it in *Amphithyrus orientalis*, though it is not perhaps in either species very freely movable, its position under the telson making such freedom not especially necessary.

Length.—At full stretch the specimen would not have measured one-tenth of an inch, and it was much less than this with the pleon flexed.

Locality.—Atlantic, surface. One specimen, male.

Family Scelidæ, Claus, 1879.

The account which Claus gives of this family both in 1879 and 1887 is as follows :—

"Shape of the body and the antennæ as in the Typhidæ, the ventral surface however generally strongly flattened; the pleon relatively larger and more produced, flexing. Lower antennæ of the female well developed. Mouth organs outdrawn, beak-like, mandibles narrow and elongate. The branchial vesicles are simple laminæ. Laminar first joint of the third peræopods ovoid, that of the fourth peræopods considerably longer and more extended. Fifth peræopods feeble, but in general with the full number of joints."

Bovallius in 1887 changes the name of the family to Parascelidæ, without, I think, sufficient cause for the alteration. He gives the following diagnosis :—

"Head large, a little deeper than the body, anteriorly produced downwards. The eyes large, occupying the whole sides of the head. First pair of antennæ fixed at the under side of the head; first joint of flagellum tumid, the rest of flagellum subterminal. The second pair fixed at the under side of the head, angularly folded (♂) or reduced (♀). Mandibles with palp. Femora of fifth and sixth pairs of pereiopoda [first joint of *Third* and *Fourth Peræopods*] transformed into imperfect opercula. Seventh pair [*Fifth Peræopods*] not transformed."

As regards the flagellum of the upper antennæ, it may be observed that the expression "subterminal" is not suitable to all the genera of the family, since in some the second joint of the flagellum is attached at the apex of the first. The statement that the mandibles have a palp is no doubt intended to apply only to the male.

Genus *Thyropus*, Dana, 1852.

1852. *Thyropus*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1008, 1012, 1443.
1879. *Tanyscelus*, Claus, Die Gattungen und Arten der Platysceliden, p. 17.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 483.
1887. *Thyropus*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 43.
1887. *Tanyscelus*, Claus, Die Platysceliden, pp. 43, 45.

For the original definition of *Thyropus*, see Notes on Dana, 1852 (pp. 259, 269). For Claus' shorter definition of *Tanyscelus*, see Note on Claus, 1879 (p. 492). His longer definition is to the following effect:—

"Body broad and produced, ventrally flattened. Point of the head outdrawn. Maxillipeds broad. Terminal joint of the lower male antennæ scarcely half as long as the preceding joint. Mouth-organs projecting beak-like. Mandibles strongly elongated, with narrow cutting-edge. Maxillæ with four comb-like dental-processes at the distal end of the plate. The two pairs of gnathopods simple, only distinguished from the following limbs by a shorter and more compact form. Laminar first joint of the fourth peræopods strikingly elongated and distally narrowed, *with short pocket-shaped groove at a distance from the ridge of the hind margin.* Fifth peræopods[1] almost completely developed, with the laminar first joint long."

Claus himself suggests that his *Tanyscelus sphæroma* may be the same as Dana's *Thyropus diaphanus*, and Bovallius without uniting the two species assigns them both to the genus *Thyropus*. Judging by the figures and description which Dana gives of his type-species, *Thyropus diaphanus*, and especially by what he says of the eyes and antennæ, there seems good reason for accepting his genus, though the type species has not yet been identified, and perhaps from defects or deficiencies in the account never will be. Dana considered that *Typhis ferus*, Milne-Edwards, belonged to this genus, and Spence Bate, as Claus has pointed out, wrongly made *Thyropus diaphanus*, Dana, a synonym of Milne-Edwards' species under the name *Thyropus ferus*.

Thyropus danæ, n. sp.

For the general appearance of the species Claus' figure of "*Tanyscelus sphæroma*" may be consulted. The head is much deeper than long, with flattened front, a little produced downwards; the first two segments of the peræon very short, the fifth, sixth, and seventh long, with conspicuously overlapping margins.

Eyes not quite reaching to the front of the head, but leaving free the produced lower point of it, and a long triangular space above this; the upper and lower groups

[1] In regard to the fourth and fifth peræopods, see remarks on the definition of the next genus, *Parascelus*.

of ocelli conterminous, of nearly equal extent, the upper groups triangular, the lower almost circular.

Upper Antennæ.—Peduncle moderately stout; first joint of flagellum longer than the peduncle, set at right angles to it, carrying a large brush of filaments; second joint attached at the apex of the first, a little longer than broad, having some long apical filaments; the third joint considerably longer and more slender, with filaments some way from the apex; the fourth joint much shorter and thinner than the third, with some apical setules.

Lower Antennæ.—Third (first free) joint of the peduncle rather more than a quarter as long as the following joint, distally narrowed; fourth joint long and slender, distally widened; fifth joint equal in length to the fourth; first joint of flagellum slender, three-quarters of the length of the preceding joint; second joint rather more than half the length of the first.

First Gnathopods.—Side-plates with convex front margin. The first joint a little widened below; the second longer than broad; the third about three times as long as wide, longer and broader than the fourth joint, with a hair-like setule at each apex and one above the centre of the hind margin; the fourth joint similar, but a little narrowed distally, with a setule at each apex; the fifth joint shorter and narrower than the fourth, a little curved, distally narrowed; the finger little curved, acute, less than half the length of the fifth joint; the whole limb peræopod-like.

Second Gnathopods similar to the first, but scarcely so long, having the first and second joints a little longer, but the third and fourth decidedly shorter, each of the two latter joints having the apical setules and a setule near the middle of the hind margin; there is also a setule near the apex of the second joint.

First Peræopods like the gnathopods, but rather longer, the difference in length depending chiefly on the fourth and fifth joints which are about equal in length; there is a spinule near the hinder apex of the second joint and one high up on the hind margin of each of the three following joints, besides subapical setules.

Second Peræopods a little longer than the first.

Third Peræopods.—The side-plates nearly as deep as the breadth, the margins convex; within the side-plates there is a long straight spine-like process pointing backwards. The first joint broadly oval, almost smooth-edged, a little shorter than the third, fourth, and fifth joints together; the second joint scarcely longer than broad, with a setule above the front apex; the third joint very much shorter than the fourth, with three setules on the front margin; fourth joint longer than the fifth, with a setule at the apex behind, and three setules on the front margin, which is sparsely and finely pectinate; the fifth joint slender, tapering, longer than the third, having three setules on the hind margin and one on the front, which has a little scarcely perceptible pectination; the finger not a quarter the length of the preceding joint.

Fourth Peræopods.—The first joint much longer than in the preceding pair, having in the broad upper part a small semicircular slit on the outer surface, followed by a longitudinal groove on the inner surface reaching far down into the narrowed lower part; the front margin presents a considerable concavity to fit the hind margin of the first joint of the preceding pair, and its rounded apex is produced below that of the hind margin; the upper part of the hind margin is strongly convex, the lower nearly straight; the small second joint is fixed so high up within the hind margin of the first joint, that the finger cannot reach the apex of that joint; the third joint considerably longer than the fourth, the hinder apex rounded, very slightly produced, the front margin not produced, pectinate with teeth directed a little backwards, increasing in strength as they approach the apex; the fourth joint stouter and a little longer than the fifth, its front margin armed much like that of the third; the fifth joint straight, narrowing distally, with very fine pectination of the front margin; the finger small, acute, about a third the length of the fifth joint.

Fifth Peræopods.—Side-plates triangular, with straight hind margin, and slightly rounded apex; they are coalesced with the segment, except for a small space behind. The first joint much longer than broad, with the hind margin convex till very near the narrow apex, the front margin concave for most of its length; the second joint not longer than broad, with very convex front margin; the third two or three times as long as the second, not broader, strongly bent upwards, with convex front margin and smoothly rounded apex. In the absence of any other joints beyond the third on this limb, the present species differs strongly from "*Tanyscelus sphæroma*," Claus.

Pleopods.—Coupling spines minute; cleft spine with a narrow subapical dilatation to the longer arm; joints of the rami seven to eight in number.

Uropods.—Peduncles of the first pair bending inwards, shorter than the rami, the convex outer margin finely pectinate; the outer ramus shorter and narrower than the inner, with finely pectinate outer margin; the broad inner ramus does not quite reach the end of the telson, narrowing rather suddenly to its sharp apex, with the inner margin divided into about eight little teeth and like the outer finely pectinate; the peduncles and rami of the second pair much shorter than those of the first, the rami narrow, the outer much smaller than the inner, the inner margin finely pectinate, and the outer also at the lower part; the peduncles of the third pair widening distally, a little longer than the distal breadth, rather longer than the outer, a little shorter than the inner, ramus; the little outer ramus not half the length nor nearly half the breadth of the inner ramus, the inner margin in each finely pectinate, the inner ramus reaching a little beyond the telson.

Telson distally broadly rounded, not so long as the breadth at the base of the third uropods, where it is completely coalesced with the broad preceding composite segment, its position marked by the gently converging sides of the segment being here

abruptly contracted for a little space, beyond which the gentle convergence is continued.

Length, in the rolled position, less than a fifth of an inch, and scarcely longer than a fifth if unrolled.

Locality.—Station 106, August 25, 1873; between St. Vincent and St. Paul's Rocks; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms; surface temperature, 78°·8. Three specimens, that described a male.

Remarks.—The specific name is given out of respect to the founder of the genus. Dana's *Thyropus diaphanus* was taken in the "Atlantic, latitude 4° 25′ south, longitude 21° 30′ west;" its "length, when extended, one-fourth of an inch; when folded up, one-eighth of an inch." It agrees in many respects with the species just described, but, if Dana's figures and descriptions may be trusted, it has the apex of the first joint of the flagellum in the upper antennæ produced over the base of the second joint, the second joint of the flagellum of the lower antennæ much less than half the first, the telson subacute, and the rami of the third uropods subequal. The last two characters cannot possibly be reconciled with the Challenger species, or with *Thyropus sphæroma* (Claus).

Thyropus sphæroma (Claus).

1879. *Tanyscelus sphæroma*, Claus, Die Gattungen und Arten der Platysceliden, p. 17.
1887. *Thyropus sphæroma*, Bovallius, Systematical List of the Amph. Hyper., Bihang. till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 43.
1887. *Tanyscelus sphæroma*, Claus, Die Platysceliden, p. 45, Taf. viii. figs. 1–11.

The Challenger specimen corresponds closely with Claus' figures and description. There is the distinguishing line of little spots of colour partly on the side-plates and partly on the adjacent margins of the segments; it is distinguished by these from *Thyropus danæ*, above described, as well as by the fifth peræopods, which have a slender fourth joint much longer than the third, and a short fifth joint. The distal end of the first joint of the fourth peræopods also appears to be less narrow than in the preceding species.

Length, at full stretch, scarcely a fifth of an inch.

Locality.—April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. One specimen, male.

Remark.—The back of the peræon in our specimen, though tumid and rounded, shows a tendency to be irregularly arched.

Genus *Parascelus*, Claus, 1879.

1879. *Parascelus*,[1] Claus, Die Gattungen und Arten der Platysceliden, pp. 17, 18.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 425.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 483.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 43.
1887. „ Claus, Die Parasceliden, pp. 43, 45.

For the shorter definition of this genus by Claus in 1879, see Note on Claus, 1879 (p. 492). In the fuller account he says :—

"Body moderately broad and rounded, yet with flattened ventral surface, as in *Tanyscelus*. Upper lip and maxillipeds projecting beak-like. The former with tongue-shaped projecting epipharynx. Mandibles narrow, outdrawn almost stiletto-like. Upper antennæ as in *Tanyscelus*. Limbs of the peræon very slender, with very long first joint. *The gnathopods simple* (enden klauenförmig). The wrist in the gnathopods with small tubercular prominence a suggestion as it were of a chela-forming process. Laminar first joint of the third peræopods compactly ovoid. *Laminar first joint of the fourth peræopods elongate, distally narrowed, without pocket-like groove.* Fifth peræopods completely developed. The rami of the uropods are narrow fin-laminæ (Flossenblätter), the inner of the second pair being the largest."

Gerstaecker in the definition of this genus includes two other characters, namely, that the head has summit-eyes and lateral-eyes combined, and that there are two gland-cells in the fourth joint of the first and second peræopods.

Dana's account of *Thyropus* does not include any mention of the pocket-like groove of the fourth peræopods as either present or absent, but the very elongated termination of the first joint in those limbs, with the remaining joints not reaching to its apex, confirms the view that *Thyropus* coincides rather with Claus' *Tanyscelus* than with his *Parascelus*. In Dana's *Thyropus* the fifth peræopods have only two or three joints, but it is evident that these limbs vary in the number of joints within the genus, if not within the species or in the individual.

Parascelus zebu, n. sp. (Pl. CLXXXV.).

Head deeper than long, the flattened front a little produced at the lower end over the insertion of the upper antennæ; the second segment of the peræon the shortest; first three segments of the pleon postero-laterally almost squared.

Eyes as in *Thyropus*.

Upper Antennæ.—In the male, first joint of the peduncle widening distally, the two following joints short, incompletely developed; the first joint of the flagellum

[1] Given as *Parascellus* in the *Zool. Jahresb.* (see Scudder's Nomenclator Zool., p. 248).

tumid, bent so that the convex lower margin with the brush of slender filaments is much longer than the upper, which has at its apex two broad filaments ; the second joint not broader than long, not so broad as the narrowed apex of the first joint, carrying three filaments ; the third joint narrower but much longer than the second, with two filaments near and one at the apex ; the fourth joint missing.

In the female, first joint cylindrical, bent, much longer than broad, second joint about half as long as the first, third half as long as the second and narrower, not longer than broad, with some apical setules ; first joint of the flagellum longer than the last of the peduncle, carrying some filaments, second joint longer and more slender than the first, third more slender than the second.

Lower Antennæ inserted at the lower part of the back of the head. In the male, the second joint of the peduncle (perhaps including the first in coalescence) is distinct, broader than long ; the next or third joint is much longer, but tolerably stout, narrowing distally, smooth-edged, more than a quarter but less than a third the length of the following joint, which is slender, ciliated, distally bulging ; the fifth joint is similar to the fourth, but more slender and a little longer ; the first joint of the flagellum is not quite two-thirds the length of the last of the peduncle, much more slender ; the second joint is not quite two-thirds of the first in length.

In the female, the third (first free) joint of the peduncle slender, scarcely longer than the fourth, the fourth with a subapical setule, the fifth a little longer than the third, with a setule remote from the apex ; the first joint of the flagellum in line with the peduncle, rather narrower and shorter than the preceding joint, with three setules near the apex ; second joint much narrower and shorter than the first, with a group of very small apical setules.

Mouth Organs very small, and from the delicacy of their texture difficult to manipulate in dissection. The *Epistome* forms a shallow dome over the cutting edges of the mandibles ; the *Mandibles* are long and narrow, the trunk rather deeper near the base than further on, the cutting edge and secondary plate of the left mandible apparently represented by two bent teeth, the palp attached near the base of the trunk, which it exceeds in length, the first joint longer than the second, the third longer than the first, narrow, tapering to a fine point ; the *First Maxillæ* are long, narrow, extremely transparent plates, the outdrawn triangular termination having on the inner margin close to the apex four minute teeth ; the shape of the *Second Maxillæ* was not discovered ; the outer plates of the *Maxillipeds* are broad, overlapping, with convex outer margin.

First Gnathopods.—The side-plates deeper than broad, the front margin convex, the lower margin with two setules near the rounded front angle. The first joint attached near the middle of the hind margin of the side-plate, slightly bent, nowhere broad, but broader below than above ; the second joint scarcely longer than broad, having like the

first joint a bristle near the apex of the hind margin; the third joint longer than the wrist, with four bristles on the front and two on the straighter hind margin; the wrist with five bristles on the convex front margin and four, of which the lowest is the longest, on the almost straight hind margin, of this the apex being narrowly and smoothly rounded, standing off from the hind margin of the hand and a little produced; the hand scarcely so long as the wrist, much narrower, tapering, having one bristle near the apex; the finger very small, curved, carrying one short bristle, and perhaps a denticle on the inner margin near the apex. Gland-cells can be traced in the first four joints of this and the following pair.

Second Gnathopods similar to the first pair but longer, especially in respect of the first and third joints. The branchial vesicles of comparatively enormous size. The first joint sinuous, only slightly widened below, carrying one bristle near the apex of the hind margin and another rather higher up; the hinder apex of the wrist a little more narrowly produced than in the preceding pair; the hand not longer.

First Peræopods.—Side-plates longer than the preceding pair. Branchial vesicles like the preceding and following pairs of great size. First joint similar to that of the second gnathopods, but longer and more slender, smooth; the second joint longer than broad; the third subequal in length to the fourth but rather shorter, with a bristle at the apex in front, one at the apex behind, and two widely apart higher up; the fourth joint rather more bent than the third, with four or five bristles along the hind margin; the fifth joint shorter than the fourth, straight except at the base, tapering, with three small bristles on the hind margin; the finger as in the gnathopods, very small.

Second Peræopods similar to the first, but with the joints rather longer, and larger side-plates.

Third Peræopods.—Side-plates broader behind than in front, larger than the preceding pair, having a strongly bent tooth on the inner surface. First joint large (yet not so large as the branchial vesicles), broadly and almost regularly oval, with five little setules at the lower end of the front margin, length of the joint almost equal to that of all the following slender joints together; just below the tooth of the side-plate there is as usual a fold on the inner surface of this joint; second joint longer than broad, rather deeply socketed in the distal end of the first joint; the third joint shorter than the fourth, the fourth a little longer than the fifth, these and the finger being similar to those of the preceding peræopods, but the fourth and fifth of greater length. In all the limbs it is possible that the finger may have some pectination and some other armature than a spinule of the inner margin near the tip, but the characters were too minute to be more than guessed at.

Fourth Peræopods.—The side-plates much larger than any of the other pairs, much deeper behind than in front. The branchial vesicles much larger than the side-plates but much smaller than the first joint of the limb. The first joint two or three times as long

as the remaining joints together, the front margin forming a little protuberance near the base, thence running with a long and a short concavity to the rounded slightly produced apical angle; the hind margin forms a great bend at the upper part, becoming almost straight lower down at the narrowed part of the joint, at this part a second hind margin of the inner surface, commencing and running a nearly parallel course, fringed with thirteen or fourteen bristles, takes the place of the other margin for a space not quite reaching to the apical angle; the short second joint is embedded in the first about one-third of the length from the sinuous distal margin; the third joint is longer than the remaining three together, strongly pectinate with retroverted teeth along the front margin down to the slightly produced and rounded apex; the fourth joint is much narrower than the third, much broader and rather longer than the fifth, the front margin pectinate; the fifth joint is a little bent at the base, tapering, with the front margin a little furred; the finger less than half the length of the fifth joint. The five terminal joints have a length sufficient to enable the finger to reach the apex of the first joint.

Fifth Peræopods.—Side-plates deeper than broad, the upper boundary incomplete. The first joint enormously larger than the remainder of the limb, strongly bent so that there is a deep concavity above the centre of the front margin, the lower part of which is straight, while the hind margin makes a great bow from the base to the apex, the distal part of the joint being strongly narrowed, so that the apex is not broader than the short bent second joint; the third joint is rather narrower than the second, a little sinuous, shorter than the fourth; the fourth is much longer than the fifth, which is equal in length to the third; the finger seems to be represented by a curved spinule, with a small setule on the apical margin behind it. There was no sign of damage to either limb, and the character of the termination was the same in both.

Pleopods.—Peduncles produced below on the inner side; the two coupling spines very short, the rounded apex having its border cut into three or four retroverted teeth; the cleft spine attached at the top of the first joint of the inner ramus, its arms short, that with the dilated end rather the shorter, the joint having three or four setæ below the cleft spine; the joints of the broad tapering rami are seven in number on the inner and eight on the outer ramus; the inner ramus is broader than the outer.

Uropods.—The peduncles of the first pair shorter than the rami, widening distally, having the lower part of the outer margin pectinate; the outer ramus much narrower but very little shorter than the inner, its outer margin finely pectinate, the inner almost smooth, the inner ramus with the lower half of its inner margin denticulate, most of the outer margin finely pectinate; the peduncles of the second pair scarcely half the length of the first, the inner ramus narrower and rather shorter than that of the first pair, the outer ramus narrower but longer than that of the first pair, much longer than its own outer ramus, the pectination minute; the peduncles of the third pair about as long as broad, the outer ramus much narrower and shorter than the inner, the margins

minutely pectinate, the inner ramus broad, with fine marginal pectination, the tips reaching back beyond all the other rami and a little beyond the apex of the telson.

Telson broader than long, triangular, with rounded apex, not quite so broad at the base as the segment with which it is coalesced; the triangle formed by the sides of the telson and those of the two preceding coalesced segments is of about equal breadth and length.

Length, three-twentieths of an inch from the front of the head to the back of the second pleon-segment, so that the total length may be regarded as one-fifth of an inch.

Locality.—January 1875, Zebu Harbour, Philippines, surface. Three specimens, one male, one female, the third not specially examined.

Remarks.—The specific name refers to the place of capture. This species closely approaches *Parascelus edwardsii*, Claus, taken in the Atlantic Ocean, and is distinguished from it chiefly by the fifth peræopods, the first joint of which is much more bent than in the Atlantic species, while the following joints bear a very much smaller proportion to the first joint, and the relative sizes of the fourth and fifth joints are different. The proportions differ also to some extent in the uropods, in the present species the inner ramus of the second pair being the longest of all the rami, but in the Atlantic species shorter than the inner ramus of the first pair.

Parascelus parvus, Claus.

1879. *Parascelus parvus*, Claus, Die Gattungen und Arten der Platysceliden, p. 20.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 44.
1887. „ „ Claus, Die Platysceliden, p. 47, Taf. viii. figs. 12–17.

For the general appearance of this little species, I may refer to the figure of *Parascelus parvus* given by Claus in Die Platysceliden, Taf. viii. All the segments of the peræon are distinct, the back is broadly rounded, the postero-lateral angles of the first three pleon-segments are not acute. The liver-tubes are very large, the heart very narrow.

Eyes as in the preceding species.

Upper Antennæ—First joint much the longest, curved, with a bristle or very slender spine at the outer apex, the second joint not twice as long as broad, the third not longer than broad, armed with two bristles, the first joint of the flagellum as long as the second of the peduncle, but more slender, the second joint longer than the first, having like it two apical bristles, the third joint linear, slightly longer than the second, having on the tip two or three bristles about as long as the joint.

Lower Antennæ.—The third (first free) joint of the peduncle slightly curved, much

shorter and more slender than the first of the upper antennæ, second joint longer than the first, third rather longer than the second, carrying one long marginal bristle; the first joint of the flagellum much shorter and narrower than the last joint of the peduncle, carrying one marginal and one or two apical bristles, the second joint almost linear, much shorter and narrower than the first, having some short bristles at its tip.

Mouth Organs small and feeble; the *Epistome* forming a dome broader than deep over the mandibles; the *Mandibles* narrow, narrowing towards the bent apex, which on the left mandible has a bidentate appearance, the two teeth representing the cutting edge and the secondary plate; whether there is any secondary plate on the right mandible is doubtful; the palp, being a character of the male, was not present.

First Gnathopods.—Side-plates squared, the front angle rounded, carrying a bristle. The first joint about as long as the third, fourth, and fifth together, widening a little near the distal end, having three minute setules on the front margin; second joint scarcely longer than broad, with a bristle near its hinder apex; the third joint subequal in length to the wrist and rather wider, the front margin convex, the hinder straight, with bristles at two points; the wrist similar to the third joint, with bristles near the front apex and at three points of the hind margin, of which the smoothly rounded apex projects a little behind the hand; the hand scarcely if at all longer than the wrist, much narrower, tapering, the front margin convex, with a short bristle near the apex, the front margin almost straight, smooth; the finger short, curved, armed with a setule, the tip bent, acute.

Second Gnathopods.—Branchial vesicles longer than the first joint and wider, narrow near the base, widening distally. Marsupial plates incompletely developed, represented by a very small oval lamina. First joint longer than in the first pair, not conspicuously widened at any part, quite as long as all the remaining joints together, with a bristle at the hinder apex; the second joint longer than broad, with two bristles on the bent hinder margin; the remaining joints as in the first pair but rather longer, not wider, the third with bristles at four points of the hind margin, the wrist with bristles at five points.

First Peræopods.—Branchial vesicles and marsupial plates as in the second gnathopods but rather larger. The first joint a little longer than in the preceding limbs, very slightly widened towards the distal end; the second joint longer than broad; the third narrower but rather longer than in the second gnathopods, similarly armed; the fourth joint much longer than the third, narrow, with a bristle at the apex of the slightly convex front margin, and four along the straight hind margin; the fifth joint slender, as long as the fourth, bent at the neck, then a little widened, straight, tapering to a narrow apex, with three bristles near the front, and four along the faintly furred or pectinate hind margin; the finger very small, about a fifth as long as the fifth joint.

Second Peræopods in close agreement with the first, the fifth joint perhaps a little longer than the fourth. The branchial vesicles are more bowed out at the centre behind.

Third Peræopods.—Side-plates broader than in the preceding pairs, without bristles, the hind part deeper than the front. The branchial vesicles similar to the preceding pair. The first joint very little longer but much broader than in the preceding limbs, the neck narrow, the remainder of the joint oval, with about eight bristles round the front margin and two or three near the top of the hinder; the remaining joints as in the preceding pair, but more elongate, bent back upon the first joint, and the two terminal joints folding against the front of the fourth joint; the third joint appears to be without spines on the front margin.

Fourth Peræopods.—Side-plates scarcely so large as the preceding; the branchial vesicles more dilated behind near the centre. First joint of long irregular pear-shape, much longer than all the remaining joints together, or than the first joint of the other pairs, broadest near the base, the hinder and rounded distal margin fringed with bristles not closely set, the hind margin on the inner surface but not on the outer emarginate for the reception of the short second joint; the third joint longer than the fourth, its front margin pectinate and carrying two bristles, apically a very little produced; the fourth joint similarly armed, but with three bristles; in each of these joints the pectination near the apex is retroverted; fifth joint scarcely so long as the fourth and much narrower, the front margin finely pectinate; the finger small but more than half the length of the fifth joint, slightly curved, tapering, pectinate on the inner margin. The third joint is capable of reaching beyond the apex of the first.

Fifth Peræopods.—Side-plates very distinct, broader than deep, the upper and lower margins parallel, the rounded hinder angle having one bristle. The first joint a little bent, rather wider above than below; the second joint nearly as broad as the extremity of the first, not longer than broad, the third joint broader than the fourth but not so long; the fourth joint with one bristle standing out stiffly near the apex of the straight front margin; the fifth joint scarcely so long as the third, bent at an angle to the fifth, but otherwise straight; on the inner side near the apex there is a stout little spine; the finger quite minute, the narrowed apical part bent up so as to convert the finger into a little sturdy hook.

Pleopods.—Coupling spines minute, with apical teeth; the cleft spine having the serrate arm shorter than that with the subapical dilatation, the first joint of the inner ramus having only one seta below the cleft spine; the rami with six joints apiece.

Uropods.—Peduncles of the first pair longer than those of the second, in both pairs shorter than the rami; the rami have pectinate edges, those of the second pair being apparently rather larger than those of the first; in each case the inner ramus is the longer; this applies also to the third pair, in which the peduncles are very short, the outer ramus reaching a little and the inner considerably beyond the telson.

Telson coalesced with the preceding segment, about as broad as long, narrowing to the rounded apex.

Length.—In the slightly bent position, which is probably natural to the animal, the specimen measured scarcely more than one-tenth of an inch.

Locality.—June 13, 1874, east of Australia; lat. 34° 13′ S., long. 151° 38′ E.; surface to 50 fathoms; surface temperature, 61°·8. One specimen, female.

Remarks.—From the specimen of *Parascelus parvus* which Claus describes from the Atlantic Ocean, the Challenger specimen differs by having the hinder apex of the wrist in the gnathopods smooth, instead of weakly crenulate, as well as by rather different relative lengths of the joints in the lower antennæ and the fourth and fifth peræopods.

Genus *Schizoscelus*, Claus, 1879.

1879. *Schizoscelus*, Claus, Die Gattungen und Arten der Platysceliden, pp. 17, 20.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 484.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 44.
1887. „ Claus, Die Platysceliden, pp. 42, 43.

For the shorter definition given by Claus, see Note on Claus, 1879 (p. 491). The fuller definition is to the following effect:—

" Peræon broad and round, with comparatively thin produced pleon. Mouth-organs outdrawn beak-like. The two terminal joints of the lower male antennæ nearly as long as the preceding. A packet of gland-cells with cuticular longitudinal ducts in the first joint of the first and second peræopods. *The first gnathopods simple, the second complexly chelate. The laminar first joint of the fourth peræopods with long, half-sickle-shaped slit.* The other joints of the limb (Beinanhang), attached almost at the distal end of the laminar joint. Fifth peræopods completely developed. The rami of the uropods widened fin-like. The inner ramus of the second pair especially enlarged."

Bovallius includes in this genus the *Typhis rapax* of Milne-Edwards, 1830, but many of the expressions used by Milne-Edwards in describing that species in his later work are opposed to such an identification. He says that it is of a more elongate form than *Typhis ferus*, that the first gnathopods have a large hand, that the second gnathopods have a very large claw, and that the laminar first joint of the fourth peræopods is not so developed as that of the third. By these characters, which are ill-suited to *Schizoscelus*, he is probably pointing to one of the Pronoidæ.

Schizoscelus ornatus, Claus.

1879. *Schizoscelus ornatus*, Claus, Die Gattungen und Arten der Platysceliden, p. 21.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 44.
1887. „ „ Claus, Die Platysceliden, p. 44, Taf. x. figs. 1–11.

A small compact species, not easily distinguishable at first sight from *Parascelus zebu*, from the same locality. Head short, broad, flattened in front, the rostrum having the tip slightly upturned; the second segment of the peræon not shorter than the first.

Eyes not covering the whole sides of the head, the ocelli of each eye apparently forming a single continuous group, which is long and rather narrow.

Upper Antennæ.—First joint of the peduncle not longer than broad, the two following joints very short, incompletely developed; the first joint of the flagellum very thick at the base so as to be nearly as broad as the length, one margin very convex, the other almost straight, the narrowed apex having on one side a series of filaments, on the other side the slender second joint which carries a filament and one or two setules; the third joint is thinner and rather longer than the second, and has a minute setule at the apex. To judge by Claus' account, when these antennæ are fully developed the filament-bearing apex of the first joint of the flagellum forms a separate second joint.

Lower Antennæ.—Gland-cone distinct; third joint of peduncle curved, two-thirds the length of the next, which is slightly sinuous, widest distally; the fifth joint about as long as the fourth; the first joint of the flagellum half the length of the last of the peduncle, sinuous; the second joint straight, longer than the first, sharply bent upon it but scarcely jointed. In the fully developed antennæ the proportions of the joints are different.

First Gnathopods.—The first joint about as long as the remainder of the limb, the hind margin sinuous; the second joint scarcely longer than broad, having a spinule on the hind margin above the apex; the third joint scarcely longer than the second, having a subapical spinule on the hind margin; the wrist a little longer and stouter than the third joint, with two spinules on the hind margin, and one at the apex of the front; the hand a little longer than the wrist, and at the base rather narrower, thence tapering, slightly curved, like the three preceding joints having a straight distal margin; the finger small, thick at the base, then rather abruptly narrowed, the terminal part bent, acute, the inner margin having a small tooth-process not far from the base.

Second Gnathopods.—The branchial vesicles oval, as long as the first joint and considerably broader. The first joint longer than in the preceding pair; the second and third joints rather larger than in that pair, the third joint having three spinules on the hind margin; the wrist with two spinules on the upper part of the hind margin, its process laminar, as long as the hand and nearly as wide, the apical part triangular, having on

the border facing the hand four slender spaced teeth, the apex forming a fifth, near which the hinder margin has three little teeth and some slight serrations; the hand and finger as in the first pair.

First Peræopods.—Branchial vesicles larger than the preceding pair, longer than the first joint. The first joint widening distally, the second not longer than broad, with a subapical spinule on the hind margin; the third joint distally widened, carrying two spinules near the apex of the very convex front margin, and a longer one at the apex of the hind margin; the fourth joint rather longer than the third, with a spinule at the front apex, a short and a long one on the hind margin; the fifth joint longer and narrower than the fourth, slightly curved and tapering; the finger scarcely half the length of the fifth joint, gently curved, tapering.

Second Peræopods like the first, with the third, fourth, and fifth joints a very little longer.

Third Peræopods.—Side-plates with a small blunt process on the inner side. Branchial vesicles not so large as the first joint. The first joint a broad oval, about as long as the remainder of the limb, the front margin flattened, descending slightly below the hind margin, having some spinules at the lower end; the second joint with one spinule on the front margin; the third joint a little shorter than the fourth, distally widened, with a spinule at the hinder apex and three spinules on the front margin; the fourth joint having a spinule at the hinder apex, two spinules on the front margin, all the front of the joint minutely scabrous, the distal margin variously pectinate; the fifth joint much narrower than the fourth, rather longer, the hind margin convex, the front nearly straight, with scarcely perceptible pectination; the finger slender, tapering, curved, not nearly half as long as the fifth joint.

Fourth Peræopods.—Branchial vesicles smaller than the preceding pair. The first joint longer than in the third peræopods, widest proximally, most of the front margin straight, descending below the hind margin, a row of eight spinules fringing the curve which unites it to the distal margin; the hind margin has some spinules or setules along the convex upper part; along a groove of the outer surface extending from the apex of the front margin towards, but not reaching, the apex of the great longitudinal slit, a row of little circular marks was observed, five in number, and a row near the upper margin of the joint; the small second joint attached near the apex of the slit; the third joint as long as the two following together, distally a little widened and produced in front for nearly half the length of the following joint, the front margin pectinate; the fourth joint abruptly narrower than the third, its front margin pectinate; the fifth joint finger-like, tapering, much narrower than the fourth, but nearly as long, finely scabrous in front; the finger obsolete, perhaps represented by the acute apex of the fifth joint.

Fifth Peræopods slender and feeble; the first joint not quite so long as the remainder of the limb, not very broad, the front margin nearly straight, the hinder convex, the apex

narrow; the second joint much longer than broad; the third longer than the second, distally widened, with slightly convex hind margin; the fourth slightly longer but narrower than the third, a little widened distally; the fifth shorter than the third, with a minute hooked finger embedded in the rounded apex.

Pleopods.—The two coupling spines very small, with apical hooks; the cleft spine slender, the longer arm having an elongate subapical dilatation; the inner ramus with six joints, the outer with seven.

Uropods.—Peduncles of the first pair not so long as the rami, the outer margin pectinate; the rami long, lanceolate, reaching beyond the telson, the inner rather the longer, each with the outer margin strongly pectinate, the inner margin more slightly pectinate and serrate; peduncles of the second pair short; the outer ramus much shorter and narrower than the inner, its outer margin with one or two teeth and a subapical spinule, the inner margin pectinate, the inner ramus subequal to those of the first pair, both margins pectinate; peduncles of the third pair very short, the rami similar to those of the second pair but smaller, and the inner ramus less strongly pectinate, the outer not reaching to the end of the telson, the inner reaching beyond it.

Telson broadly triangular, with rounded apex, the margin very minutely pectinate.

Length, one-tenth of an inch, if fully extended.

Locality.—January 1875, Zebu Harbour, Philippines; surface. One specimen, male.

Remarks.—It is clear from the antennæ it is not fully adult, although of the same size as Claus' specimens from the Atlantic. The shape of the fifth peræopods is intermediate between that which Claus figures for the male and that which he figures for the female. The tooth on the finger of the gnathopods is not figured by Claus, the process of the wrist of the second gnathopods as he represents it does not entirely agree with that in the Challenger specimen, and he gives a wider apex to the telson, but the differences do not seem to justify the establishment of a new species. The little circular marks on the front rim of the segments and on the outer surface of the first joints of the third and fourth peræopods are very difficult of observation, nor was I able to discover whether Claus' expression "Integument mit Grubenreihen" was properly applicable to them, since I could not make out any depression of the surface in connection with them.

Family Pronoidæ.

In 1852 Dana made the Pronoinæ the second subfamily of the Typhidæ, with the two genera *Pronoe* and *Lycæa*. Claus in 1879 made the Pronoidæ the third family of the Platyscelidæ, with the genera *Pronoë*, *Eupronoë*, and *Parapronoë*. He defines it as follows:—

"Body only moderately broad, laterally compressed, Gammarid-like, with powerfully developed, semi-flexing pleon. Rostral point very short and scarcely noticeable. Hinder pair of antennæ present in the female. Plates of the maxillæ powerfully developed. Branchial vesicles with lateral accessory compartments. The laminar first joint in the third and fourth peræopods only moderately extensive and not completely covering the breast."

Bovallius includes in the family, together with the three other genera, the genus *Amphipronoë*, Spence Bate, about the validity of which Claus is doubtful. He gives in 1887 the following definition :—

"Head large, not deeper than the body, a little produced anteriorly. Eyes large, occupying the whole sides of the head. First pair of antennæ fixed at the under-side of the head; first joint of flagellum tumid, the rest of flagellum subterminal. The second pair fixed at the under-side of the head, angulated (*Pronoë*) or angularly folded. Mandibles with palp. Femora of the fifth and sixth pairs of pereiopoda [first joint of *Third* and *Fourth Peræopods*] broad but not transformed. Seventh pair [*Fifth Peræopods*] reduced."

It is a question of terminology whether the first joint of the third and fourth peræopods should be said to be "transformed" in the Typhidæ and "not transformed" in the Pronoidæ; the general character is the same in both, though there are differences of proportion.

Genus *Pronoe*, Guérin, 1836.

1836. *Pronoe*, Guérin, Magasin de Zoologie, Ann. 6, Classe vii. p. 6.
1838. „ Milne-Edwards, Hist Nat. des Anim. sans vertébres, t. v.
1840. „ Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 239.
1840. „ Milne-Edwards, Hist. Nat. des Crust., t. iii. p. 98.
1852.[1] „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1009, 1015, 1443.
1862. *Pronoë*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 336.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, p. 23.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 484.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 40.
1887. „ Claus, Die Platysceliden, p. 48.

For the original definition of the genus, see Note on Guérin, 1836 (p. 165). To distinguish it from *Eupronoë* and *Parapronoë*, Claus gives the characters, "Both pairs of gnathopods simple. Front antennæ of the male with two-jointed flagellum, hinder antennæ short, only once or twice folded" (see p. 492).

Claus' fuller definition of this genus is to the following effect :—

[1] It should be observed that *Pronoe brunnea*, the only species referred by Dana to this genus, is now transferred to *Eupronoë*, Claus.

"Body produced, strongly compressed laterally, with large triangular head, strongly narrowed in front. Front antennæ of the male with tumidly produced peduncle (mit kolbig gestrecktem Schaft) and two-jointed flagellum. Hinder antennæ of the male five-jointed, with short middle joint, not laid together in zigzag folding. Both pairs of gnathopods have a monodactyle termination (neither chelate nor subchelate). Third peræopods very strong and long, with produced laminar first joint. Fourth peræopods very thin and feeble, with the laminar first joint broad and irregularly extended. Fifth peræopods rudimentary, reduced to the extensive first joint with wart-like appendage. The peduncles of the uropods elongate, those of the second and third pairs about as long as their fin-like widened rami. Telson quite reduced."

The two-jointed flagellum of the upper antennæ in the above definition refers only to the slender terminal joints, not including the large joint regarded in this Report as the first of the flagellum.

Pronoe capito, Guérin (Pl. CLXXXVI.).

The synonymy of the species will be found in the places cited for that of the genus, with the exception of the references to Dana and Gerstaecker.

Upper Antennæ.—Peduncle not very tumid, first joint not longer than broad, second and third joints much shorter; first joint of the flagellum nearly twice as long as the peduncle, almost straight, but with somewhat sinuous margins, the upper with some fine hairs at intervals, the under with a thick brush of filaments; the minute second joint attached at the apex of the first, carrying some filaments below the centre of its lower margin; the third joint linear, longer than the second.

Lower Antennæ.—Opening of the gland-cone in a laminar joint, at some distance from the point at which the third joint of the peduncle is socketed; the third joint narrow, straight, in the same line with the fourth, which is only half as long; the fifth joint forming an angle with the fourth, not half as long; the flagellum bent back at right angles to the fifth joint of the peduncle, the first joint longer than the second, the two together shorter than the third joint of the peduncle; the last three joints of the peduncle and the two of the flagellum fringed with short filaments, which are closest together on the terminal joint of the flagellum, but infrequent on the fifth joint of the peduncle.

Mandibles.—The cutting edge straight, striated, and finely denticulate, with a blunt tooth or projection at the upper end and a small sharp upturned tooth at the lower; the secondary plate of the left mandible similar to the principal, but without projections at the extremities; the palp with very large first joint, much broader and longer than the two following together; the second broader and a little longer than the third; the third curved, blunt-ended, having adpressed hairs on its surface.

Lower Lip.—The front lobes narrow, not quite acute, the lip widened below, not produced into mandibular processes.

First Maxillæ.—The distal margin forming two processes, of which the inner is the longer; the inner margin indented and carrying a spinule a little below the apical process.

Second Maxillæ.—These appear to reach somewhat beyond the first maxillæ and to have the outer margin produced into a small process, while the inner margin apically bulges inwards.

Maxillipeds.—The second joint broad, the distal margin and adjacent parts of the outer surface scabrous with spinules of various sizes; the inner plate small, longer than broad, the two embedded spinules planted near together some way below the distal margin; the broad outer plates covering most of the inner plate and arching over it, the corrugated inner margin minutely pectinate; little spinules are spread about on the lower part of the outer surface, and a row is submarginal to the distal part of the outer border.

Length, in the position figured, nine-twentieths of an inch.

Localities.—October 1875, South Pacific; surface. One specimen, male.

April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface; surface temperature, 72°·8. Five specimens, males.

April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 72°. One specimen, male.

Remarks.—The figures, with the exception of fig. *l.i.* A., are taken from the Pacific specimen; it differs from the Atlantic specimens in being without pigment spots, in having longer hands to the gnathopods, and in not having a minute marginal groove in the upper part of the first joint of the fifth peræopods. For these reasons I at first proposed to make of this a new species under the name *Pronoe immaculata*, but I abstain from doing so for want of opportunity to determine whether these slight differences are constant, and for the further reason that, as Guérin says nothing of his species being spotted, but describes it as "jaunâtre," it is possible that the flecked specimens may have the better claim to be treated as new.

Genus *Eupronoë*, Claus, 1879.

1879. *Eupronoë*, Claus, Die Gattungen und Arten der Platysceliden, pp. 23, 26.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 484.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 40.
1887. „ Claus, Die Platysceliden, pp. 48, 50.

For the original definition of this genus, see Note on Claus, 1879 (p. 492), and for the suggestion that *Orio*, Cocco, 1832, as limited by de Natale in 1850, may be the

same as *Eupronoë*, see Note on de Natale, 1850 (pp. 240, 241). Dana's *Pronoe brunnea* is considered by Claus and Bovallius to belong to this genus.

Claus' fuller definition of the genus is to the following effect:—

"Body *Pronoë*-like, still only little compressed, with short arched head. The front antennæ of the male seven-jointed, with three-jointed flagellum, those of the female six-jointed. The hinder antennæ of the male packed in with zigzag folds, the basal joint very long, the terminal joint short, almost finger-like; the hinder antennæ of the female weak, four-jointed. Mandibles compact, with deep cutting edge, bounded by two teeth. The maxillary plates well developed. Maxillipeds with weak short inner plate, the outer plates with deeply convex inner margin fringed with hairs. The first gnathopods complexly subchelate, the second complexly chelate. Third peræopods long and strong, with the laminar first joint forming a large elongate oval. The laminar first joint of the fourth peræopods broad and extensive, distally triangularly narrowed, with the distal margin sinuous (mit ausgeschweiftem Vorderrand). Fifth peræopods reduced to a three-sided pointed laminar first joint and a pimple-like appendage. Peduncles of the uropods moderately shortened, those of the last pair very short. The rami of the last two pairs are long fin-like leaves of great tenuity, reaching much beyond the medium-sized telson."

In this Report four of the seven joints of the upper antennæ are regarded as belonging to the flagellum.

Eupronoë inscripta, n. sp. (Pl. CLXXXVII.).

This species has many points of resemblance with *Eupronoë maculata*, Claus, but instead of being very strongly flecked like that species, it has but few flecks, and on the other hand the first three pleon-segments are very strongly printed with numerous transverse lines; they have their postero-lateral angles not rounded but more or less acute; the first joint of the mandibular palp is broader, straighter, and less elongate, than that represented in Claus' figure; the third joint in the fourth peræopods has a more produced front apex, and the first joint of the fifth peræopods has a breadth more than half the length instead of considerably less than half.

Head longer than deep, narrowed in front; first two segments of the pleon together as long as the whole of the peræon; the after part of the pleon broad and flat.

Eyes.—The upper and lower groups of ocelli closely combined.

Upper Antennæ.—The first joint of the peduncle much broader than long, the two following joints incompletely developed, the third overlapped by the second; first joint of the flagellum very large, but not broader at the base than the first joint of the peduncle, the lower margin very long and convex with a great brush of long filaments, the rounded apex produced as far as the end of the second joint, the upper margin

smooth and nearly straight; the second joint quite small, longer than broad, with a narrow neck; the third joint slender, broken.

Lower Antennæ.—Gland-cone conspicuous; the third (first free) joint of the peduncle elongate, about four-fifths of the length of the following joint, bent near the base, the concave margin ciliated like the rest of the antenna, the fourth joint narrow, dilated a little near the apex; the fifth joint a little or not at all shorter than the fourth; the first joint of the flagellum curved, about three-quarters as long as the third joint of the peduncle; the second joint straight, very short and narrow.

Epistome with the distal border furry.

Mandibles.—Cutting edge broad and straight, striated, and microscopically denticulate, with a projecting tooth at each extremity; the secondary plate of the left mandible denticulate like the principal plate, but with no projecting teeth; close to the base of the secondary plate, at some distance from the top of it, there is situated a little tooth-like process; on the right mandible a ridge corresponding with the base-line of the secondary plate on the left mandible is not produced into a plate, but adjoining it there is a tooth-like process larger than that on the left mandible. First joint of the palp a little shorter than the second and third together, much broader than either; the third longer than the second, curved, almost acute.

Lower Lip with the apical part strongly furred or ciliated.

First Maxillæ.—Immediately below the little apical tooth there are on the inner margin three small crenate or three-pointed teeth.

Maxillipeds.—The inner plate short, as broad as the length, with two embedded teeth below the centre of the strongly furred apical margin; outer plates broad and long, strongly furred on and near the inner margin; these plates when *in situ* bent at an angle to the basal joints extend in front of the cutting edge of the mandibles to the upper lip.

First Gnathopods.—The side-plates with the lower front angle acute. The first joint strongly twisted, very narrow at the middle, above this forming a great rounded elbow behind, the lower part of the joint dilated, with the hind margin nearly straight, the front very convex; the second joint not longer than broad; the third wrist-like, distally dilated so as to be broader than long, scarcely perceptibly pectinate at the rounded apex behind; the wrist dilated, as broad as long, as long as the hand, with smoothly convex front margin, the hind margin finely pectinate except near the base, the teeth of the pectination slender and sharp, the upper part of the margin very convex, the lower part a little concave, the muscles occupying only the front part of the joint; the hand without palm, apically not half as broad as in the upper part, the hind margin pectinate, but near the apex very slightly; the finger half the length of the hand, slightly curved.

Second Gnathopods.—Side-plates transversely oval. The first joint with a narrow straight piece above and a broadly dilated piece below; the second and third joints nearly as in the first pair, but larger; the wrist with the proximal part broader than long, the

front margin a little produced, with rounded apex, the hind margin pectinate except near the base, the triangular distal process rather broad, not quite so long as the hand, with the inner margin pectinate as well as the outer; the hand similar to that of the first pair, but a little larger, and with the whole of the hind margin distinctly pectinate; the finger rather less than half the length of the hand, slightly curved; there are numerous gland-cells in the first four joints of these and the preceding gnathopods.

First Peræopods with scarcely any perceptible armature; the first joint narrowest near the base and a little narrowed distally; the second joint short; the third shorter than the fourth, widening from a narrow neck, the front apex rounded, not produced; the fourth widest near the base, narrowing distally; the fifth narrower than the fourth, scarcely longer, apically narrowed; the finger slender, curved, about a third the length of the fifth joint.

Second Peræopods very similar to the first, but with a much longer third joint, this being longer than the fourth; the fourth joint is rather narrower than in the preceding pair, shorter than the fifth.

Third Peræopods.—Side-plates narrowed in front. First joint oblong, about twice as long as broad, not nearly so long as the following joints together, the front margin descending a little below the hinder, and with some shallow serration of the lower part; the angles are not very strongly rounded; the second joint short, yet long enough to reach below the front margin of the first joint; the third joint longer than the fourth, finely pectinate along the front and apical margins; the fourth joint more strongly pectinate than the third, except close to the apex, where the pectination becomes very fine on one surface and ceases on the other; the fifth joint slightly curved, longer than the third, more strongly pectinate than the fourth, the hind margin having an apical spine; the finger slender, about a third of the length of the fifth joint, a little bulbous at the base.

Fourth Peræopods.—First joint very large, broadly pear-shaped, longer than all the following joints together, the front margin a little sinuous, the hind margin extremely convex above, reaching nearly as far down as the front, the short distal margin straight, with rounded corners, the front one serrate with four or five indents; the second joint very short; the third as long as the fourth and fifth together, strongly pectinate along the front margin, and produced for three-quarters of the length of the fourth joint; the fourth joint more than half the length of the fifth, the front margin pectinate, not produced; the fifth joint slightly curved, with pectinate front margin, and a spine at the apex of the convex hind margin; the finger about a third of the length of the fifth joint.

Fifth Peræopods.—The first joint smooth, pear-shaped, not twice as long as the breadth at the upper part; the second (terminal) joint about a quarter as long as the first, oval, the neck narrow.

Pleopods.—Peduncles stout; coupling spines small; cleft spine apparently with the dilated arm longer than the other, the dilatation narrow; the first joint of the inner

ramus not very elongate, but having several setæ below the cleft spine; joints of the rami twelve or thirteen in number.

Uropods.—Peduncles of the first pair much shorter than the rami; the rami long, three-sided, strongly pectinate on two edges, the outer narrower than the inner but about equal to it in length, the apex of each acute, free from teeth; peduncles of the second pair a very little shorter than those of the first, much shorter than the rami; the rami thinly laminar, smooth, with rounded apices, reaching beyond those of the first pair; the peduncles of the third pair not longer than broad; the rami like those of the second pair, but the outer rather shorter than the inner, and the apices more broadly rounded.

Telson broad at the base, arched in outline, longer than broad, about two-thirds the length of the inner ramus of the third uropods, the acute apex not quite reaching the apices of the first uropods.

Length, about nine-twentieths of an inch.

Localities.—October 5, 1873, South Atlantic; lat. 29° 1′ S., long. 28° 59′ W.; surface, night; surface temperature, 65°·2.

Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. Two specimens, the one examined a male.

Remarks.—The specific name refers to the markings of the pleon-segments. The specimen from the Pacific was nearly two-fifths of an inch in length, and differs from the Atlantic specimen very slightly, as in having the elbow more exaggerated in the first joint of the first gnathopods, and in having a still broader first joint to the fifth peræopods. Claus' *Eupronoë maculata* is from Zanzibar.

Eupronoë pacifica, n. sp.

The species bears a general resemblance to *Eupronoë minuta*, Claus. The first two segments of the peræon are dorsally coalesced, the side-plates of all the seven segments distinct. The postero-lateral angles of the first three pleon-segments are all more or less blunt, those of the third segment well rounded; the fourth segment about as long as the composite segment which follows it. On many parts of the animal hexagonal markings are conspicuous.

Upper Antennæ.—The three joints of the peduncle successively shorter; the first joint of the flagellum equal in length to the second and third of the peduncle, broad at the base, rapidly tapering, carrying two transverse bands of four filaments apiece, the second joint cylindrical, shorter than the first, with two filaments, the third joint filiform, much longer than the second.

Lower Antennæ.—First free joint a little bent at the base, a little longer than the second; the second scarcely longer than the third; the third and fourth subequal, all of them smooth, not much angled in position; there is a minute apical joint. The antennæ in the specimen are no doubt those of a young male, the first three joints belonging to the peduncle, and the last two to the flagellum.

Mandibles.—The cutting edge finely denticulate between the two more prominent teeth, of which one stands at each corner; the tooth-like process representing the secondary process on the right mandible very small; the palp (in the specimen) short and curved, with only an indication of division into three joints.

First Maxillæ.—There are four strong teeth projecting from the distal part of the plate's inner margin, the appearance being suggestive of a little spine-tooth embedded in a process rather wider than the tooth.

Second Maxillæ much shorter than the first, smooth.

Maxillipeds.—The inner plate nearly as broad as long, the distal margin furred, having at the centre two little embedded spines, the outer corners rounded, the outer plates broad, much longer than the inner, submarginally furred on the inner surface near the inner edge.

First Gnathopods.—First joint not twisted, dilated at and below the middle, the margins smooth, the front sinuous; the second joint not longer than broad; the third longer and broader than the wrist, with narrow neck, distally widened, with a rounded apex in front very slightly produced, the hind margin very minutely pectinate, distally produced into a broad rounded lobe; the wrist scarcely so long as broad, the front margin convex and apically a little acute, the hind margin sinuous at the narrow neck, then convex and pectinate, projecting far behind the much narrower hand; the hand longer than the wrist, narrow at the neck and still more at the apex, the hind margin pectinate at the centre; the finger slender, curved, half the length of the hand or a little more.

Second Gnathopods.—First joint a little longer and less dilated than in the preceding pair; second joint short; third joint as in the first pair, but the front and hind apical lobes more equal; the wrist broader than the third joint, its proximal part shorter than the hand, the broad triangular apical process also shorter than the hand, pectinate on both margins, at the base standing a little apart from the hand, which resembles that of the first gnathopods, but has the hind margin more strongly pectinate; finger as in the first pair.

First Peræopods with smooth margins or scarcely perceptible armature. First joint a little bent at the base, and below this the front margin sinuous, the hinder gently convex; the second joint a little longer than broad; the third shorter than the fourth, but broader, with narrow neck, the apices rounded; the fourth narrowing distally, with straight distal margin; the fifth joint longer than the fourth, slightly bent, narrow,

especially at the apex ; the finger slender, curved, between half and a third of the length of the fifth joint.

Second Peræopods similar to the first, but with the first joint rather more slender and sinuous, and the third, fourth, and fifth joints longer.

Third Peræopods.—The first joint not so long as the remaining joints together, oblong, a little widened in the upper half, the front margin descending a little below the hinder, the produced portion being narrow, with no flat distal margin; the third joint broader than the fourth but shorter, the hind margin descending a little below the finely pectinate front margin, so that the distal border is oblique ; the fourth joint broader than the fifth but a little shorter, the front margin pectinate ; the fifth joint almost straight, the pectination of the front margin more oblique than in the other two joints; the finger slender, smooth, apically a little curved, half the length of the fifth joint.

Fourth Peræopods.—The first joint much longer than all the remaining joints together, the front margin nearly straight but with a little lobe at the base, the hind margin convex, the distal margin oblique, between half and a third of the greatest breadth of the joint, the front corner with some minute serration and the margin itself with some microscopic pectination or striation ; the narrowly rounded apical lobe of the hind margin fully reaches the flattened distal end of the front of the joint; the short second joint placed at the top of the distal division of the first, not long enough to reach the lower end of the slit; the third joint with the front margin strongly pectinate, the teeth directed a little backwards, the apical prolongation of the front broad, completely overlapping the fourth joint and reaching beyond it; the fourth joint very finely pectinate on the front margin, about as long as the proximal portion of the third joint; the fifth joint a little longer than the fourth, finely pectinate on the front margin ; the finger little more than a third the length of the fifth joint, very finely pectinate.

Fifth Peræopods.—Side-plates with the slightly convex hind margin much deeper than the straight front, so that the lower margin is very oblique. The first joint about as long as the greatest breadth of the first joint in the preceding pair, the greatest breadth about a third of the length, the front margin concave, the hinder convex, the apex narrow ; the second or terminal joint narrowly oval, between a third and a fourth of the length of the first joint, about three times as long as broad.

Pleopods.—The peduncles showing hexagonal markings; coupling-spines small, without lateral teeth; cleft spine with a very narrow dilatation; eight or nine joints to each ramus.

Uropods.—Peduncles of the first pair pectinate at the apex of the outer margin, not longer than the outer ramus, which is narrower and a little shorter than the inner, and reaches a little beyond the telson ; both rami strongly pectinate on two edges, with the apex acute, free from teeth ; peduncles of the second pair shorter than those of the first pair, the rami thinly laminar, apically rounded, the outer shorter than the inner, both

reaching beyond the inner ramus of the first pair; peduncles of the third pair short, the rami similar to those of the second pair, reaching considerably beyond them, the outer very little shorter than the inner.

Telson about as long as the breadth at the base, with slightly curved sides and well-rounded apex, about half the length of the rami of the third uropods, much shorter than the preceding composite segment.

Length, about one-fifth of an inch.

Locality.—Station 251, July 10, 1875; North Pacific; lat. 37° 37′ N., long. 163° 26′ W.; surface temperature, 65°. One specimen, male, not adult.

Remarks.—The specific name refers to the ocean in which the species was found. From *Eupronoë minuta*, Claus, it is distinguished especially by the more produced third joint of the fourth peræopods, but also by the simple, not twisted, first joint of the first gnathopods, and the more slender first joint of the fifth peræopods.

Eupronoë minuta, Claus.

1879. *Eupronoë minuta*, Claus, Die Gattungen und Arten der Platysceliden, p. 28.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 41.
1887. „ „ Claus, Die Platysceliden, p. 53, Taf. xiv. figs. 7–12.

The fourth segment of the pleon shorter than the following composite segment.

Eyes light-coloured in the specimens preserved in spirits.

Upper Antennæ.—The first joint of the peduncle broader than long, as broad as the first joint of the flagellum.

Lower Antennæ.—Third (first free) joint of the peduncle swollen at the base, then narrow, and the distal half again widened, the concave margin ciliated; the fourth joint longer than the third, and the fifth than the fourth; the first joint of the flagellum a little curved, about half as long as the last joint of the peduncle, the second joint very slender, about a seventh of the length of the preceding joint.

First Gnathopods.—The first joint more strongly twisted than in Claus' figure, the portion below the twist much longer than broad; the remainder of the limb nearly as in *Eupronoë pacifica.*

The Second Gnathopods and *First* and *Second Peræopods* nearly as in *Eupronoë pacifica.*

Third Peræopods with the first joint more elongate than in the species just named, and the front margin concave at the centre instead of convex.

Fourth Peræopods.—The first joint with slightly sinuous front margin, but without a lobe at the base, the distal margin of the front part not oblique, reaching below the

apex of the hind margin; the hind margin not uniformly convex, but almost straight for a large space on either side of the centre; the apical part of the third joint not quite reaching the apex of the fourth; the fourth joint about as long as the fifth.

Fifth Peræopods nearly as in *Eupronoë pacifica*, but the first joint rather broader at the upper part, and the narrowly oval terminal joint smaller in proportion to the first.

The Pleopods, *Uropods*, and *Telson* differ little from those of *Eupronoë pacifica*, but the telson has a narrower apex.

Length, about one-fifth of an inch.

Locality.—Station 288, October 21, 1875; South Pacific; lat. 40° 3′ S., long. 132° 58′ W.; surface; surface temperature, 54°·5. Five specimens.

Eupronoë intermedia, n. sp. (Pl. CLXXXVIII.).

Viewed from above the head has a triangular outline, with an almost acute apex; the fourth segment of the pleon a little shorter than the following composite segment.

Antennæ nearly as in *Eupronoë inscripta;* in the upper antennæ the first joint of the flagellum, besides the great brush of filaments on the convex margin, has two broad filaments on the apex of the upper margin; the second has four near the middle, the third has two; the fourth joint is linear, nearly as long as the two preceding together.

Upper Lip a broad shallow dome.

Mandibles.—The trunk sinuous, forming an upward bent angle behind the palp and one downward bent in front of it; the cutting edge broad, with a prominent tooth at each extremity, the lower one the more acute, the intermediate margin straight, very minutely denticulate; the left mandible shows a similarly denticulate secondary plate, without prominent teeth at the extremities, and besides this near the middle of the straight hind margin of the secondary plate there is a small process like a short blunt tooth or spine; there is a similar and not larger process on the right mandible; the palp is placed on a short joint-like elevation, the first joint broader and longer than either of the others, not equal in length to the two together.

First Maxillæ.—There are four teeth on the inner margin near the apex of the plate.

Second Maxillæ and *Maxillipeds* as in *Eupronoë pacifica.*

First Gnathopods.—Side-plates with the advanced front corner rounded, not acute. The first joint strongly twisted, the neck very narrow, but the elbow as broad as the lower part of the joint; the third joint broader than the wrist, not more produced behind than in front, the hinder margin pectinate chiefly at the lower part; the wrist not longer than broad, distally narrower than near the base, the hind margin sharply

pectinate except at the upper part; the hand a little longer than the wrist, but much narrower, the hind margin finely pectinate; the finger more than half the length of the hand.

Second Gnathopods as in *Eupronoë inscripta*, but the wrist somewhat less bulky, and the finger half the length of the hand.

First Peræopods.—First joint a little bent, proximally narrow, then somewhat widened; the third joint a little shorter than the fourth, the rounded front apex slightly produced; the fourth joint scarcely narrowed distally, the straight hind margin lightly pectinate; the fifth joint longer than the fourth, the slightly concave hind margin pretty strongly pectinate; the finger slender, with a bulbous hinge, nearly half as long as the fifth joint.

Second Peræopods similar to the first, but the third, fourth, and fifth joints longer, the third as long as the fourth or rather longer, the fifth more slender than in the preceding pair.

Third Peræopods.—The first joint with the front margin concave at the centre, with six sharp serration teeth below, the front apex rounded, not very broad, produced a little below the hind margin; the third joint longer than the fourth, pectinate along the front margin, the hind margin having a slightly produced pointed apex; the fourth joint more strongly pectinate along the front, the pectination near the apex being finer than above; the fifth joint longer than the third, pectinate like the fourth, but still more strongly, the hind margin ending in a slender tooth or spine; the finger as in the preceding pairs.

Fourth Peræopods.—The front margin of the first joint slightly concave, the hinder gently convex so as to give the joint a uniform breadth for more than half its length; the distal margin in front, instead of sloping up to the hind margin as in *Eupronoë pacifica*, slopes downwards away from it, forming a narrow distal piece of the front below the hinder part of the joint; the second joint very small, not nearly reaching the extremity of the first; the third joint longer than the fourth and fifth together, the front margin strongly pectinate, produced nearly to the end of the trunk of the fourth joint, the hind margin with the apex acute, a little produced; the fourth joint much shorter than the fifth, pectinate more finely than the third, and apically a little produced; the pectination of the fifth joint intermediate in strength between that of the third and that of the fourth; the finger a little pectinate, about half the length of the fifth joint. It will be seen, by a comparison of the two figures of *prp*^{4}, that the produced portions of the third and fourth joints only come into view when the inner surface of the limb is under observation.

Fifth Peræopods.—The first joint narrowly pear-shaped, the front margin nearly straight, the hinder not at all apically produced; the terminal joint narrowly oval, not quite a third as long as the first.

Pleopods.—Joints of the rami from nine to ten in number.

Uropods scarcely differing from those of *Eupronoë inscripta*, except that the peduncles of the first and second pairs appear to be shorter in proportion to the rami.

Telson rather more than half the length of the third uropods, a little longer than broad, triangular, with a tolerably acute apex, gradually reached without any abrupt narrowing.

Length, between a fifth and a quarter of an inch.

Locality.—Station 106, August 25, 1873; Tropical Atlantic; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms; surface temperature, 78°·8. One specimen, male.

Remark.—The specific name refers to the similarity which the species presents in different points to various others, such as *Eupronoë armata*, Claus, and those which have been mentioned in the description.

Eupronoë atlantica, n. sp.

Head deep and laterally somewhat compressed; the frontal space which is not occupied by the eyes having little dark colour-spots.

Eyes very dark in the specimens preserved in spirits.

Lower Antennæ.—Third (first free) joint of the peduncle slightly longer than the fourth, the fifth a little longer than the third; the first joint of the flagellum only a third as long as the last of the peduncle, the small and slender second joint not a quarter the length of the first.

First Gnathopods.—Side-plates produced to an almost acute apex in front. First joint not twisted, broadest below the middle, both margins somewhat sinuous, the front one the more so, this having five cilium-bearing indents; near the hind margin at the upper part of the inner surface there are short lines or grooves corresponding with those which in some species form the great projecting elbow in this joint; second joint very small; third joint much larger than the wrist, narrow at the neck, the distal breadth equalling the length of the joint, most of the very convex hind margin finely pectinate; the wrist not longer than broad, at its widest much narrower than the preceding joint, the irregularly convex hind margin pectinate where free from the lobe of the front joint; the hand rather longer than the wrist; the finger curved, fully half the length of the hand.

Second Gnathopods.—First joint with the sinuous front margin almost smooth, the hind margin smooth, slightly convex; the third joint smaller than the wrist, the hind margin slightly furred, its rounded apex a little produced; the proximal part of the wrist not so long as the hand, the pectinate process rather broad, not so long as the hand, on

the inner or front margin having three little teeth, then with a smooth piece bending slightly away from the hand, the rest of the margin pectinate; the hand with three little teeth at the base of the hind margin, followed by a short smooth portion, the remainder being pectinate. The three little teeth of the wrist-process above mentioned appear to be present in all the species of the genus, though they are often very inconspicuous; the teeth at the base of the hand do not appear to be so constant.

Peræopods in close agreement with those of *Eupronoë minuta*. The third pair have a backward-directed blunt lobe on the inner side of the side-plates, and the branchial vesicles of the fourth pair besides the lateral pockets have a second division behind the larger front one, the front division being strongly narrowed near the apex; but these characters are, I believe, common to all the species of the genus.

Telson longer than the breadth at the base, the apex narrowly rounded, the length more than half the total length of the third uropods, the relative size exceeding that of the telson of *Eupronoë minuta*.

Length of the extended specimen, about a fifth of an inch.

Localities.—April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night; surface temperature, 73°. Several specimens.

April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. Several specimens.

Remarks.—The characters here given of the lower antennæ, gnathopods, and telson, appear to separate this species from that which I have supposed to be Claus' *Eupronoë minuta*, to which otherwise it shows many points of resemblance in detail. If preserved specimens may be trusted, the two forms can, moreover, be easily distinguished by the colour of the eyes.

The following table will show the distribution of the genus *Eupronoë* as illustrated by the Challenger specimens:—

1. Station 353, May 3, 1876; North Atlantic; lat. 26° 21′ N., long. 33° 37′ W.; surface. Three small specimens.

2. April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night.

3. April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface, night. Fourteen specimens; the length of a specimen, fully extended, about one-fifth of an inch, rather under than over.

4. Station 106, August 25, 1873; Tropical Atlantic; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms. One specimen. (*Eupronoë intermedia*, see p. 1517.)

5. October 5, 1873, South Atlantic; lat. 29° 1′ S., long. 28° 59′ W.; surface, night. (*Eupronoë inscripta*, see p. 1510.)

6. March 15, 1874, south of Australia; lat. 39° 45′ S., long. 140° 40′ E.; surface.

Several specimens. (Apparently a species near to, but not identical with, *Eupronoë atlantica;* the specimen examined measured three-tenths of an inch in length.)

7. March 16, 1874, south of Australia; lat. 39° 22′ S., long. 142° 27′ E.; surface. Ten specimens, males, agreeing with those last mentioned.

8. Station 164B, June 13, 1874; east of Australia; lat. 34° 13′ S., long. 151° 38′ E.; surface to 50 fathoms. One specimen.

9. April 4, 1875, North Pacific, south of Japan; lat. 25° 33′ N., long. 137° 57′ E.; surface. One specimen.

10. July 1875, North Pacific, between Japan and Honolulu; surface. Several specimens.

11. Station 251, July 10, 1875; North Pacific; lat. 37° 37′ N., long. 163° 26′ W. (*Eupronoë pacifica*, see p. 1513.)

12. August 24, 1875, Mid Pacific; lat. 13° 1′ N., long. 151° 50′ W.; surface, at night. Four small specimens.

13. Station 287, October 19, 1875; South Pacific; lat. 36° 32′ S., long. 132° 52′ W.; surface. Five small specimens.

14. Station 288, October 21, 1875; South Pacific; lat. 40° 3′ S., long. 132° 58′ W.; surface. Four specimens.

Genus *Parapronoë*, Claus, 1879.

1879. *Parapronoë*, Claus, Die Gattungen und Arten der Platysceliden, pp. 23, 29.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 485.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk. Akad. Handl., Bd. 11, No. 16, p. 42.
1887. „ Claus, Die Platysceliden, pp. 48, 53.

For the shorter definition of this genus, see Note on Claus, 1879 (p. 492). The fuller definition which Claus gives of it is to the following effect:—

"Body *Pronoe*-like, but less strongly compressed, with more rounded head, the pleon bent and having its hinder section generally flexed. Antennæ and mouth-organs like those of *Eupronoë*, the latter, however, far longer and more produced. The first gnathopods simple, the second complexly chelate. Laminar first joint of the third peræopods broad and of oval form, that of the fourth peræopods of greater extent, triangular, distally narrowed and truncate, with short longitudinal ridge. First joint of the fifth peræopods of smaller extent, the appendage rudimentary, one- or two-jointed. Hinder section of the pleon distinguished by the elongation of the coalesced fifth and sixth segments. Last pair of uropods with very short peduncle and short, more or less fin-like, rami."

In further observations on the genus Claus says, "Both antennæ have the same

jointing as those of *Eupronoë*, yet the peduncle of the front pair is more slender and produced, the penultimate joint of the hinder antenna relatively shorter, since it scarcely equals a third of the preceding joint." In the shaft or peduncle of the front pair he includes, it must be remembered, what in this Report is regarded as the first joint of the flagellum. In regard to the jointing of the hinder antenna, it may be noticed that the third (first free) joint of the peduncle is shorter than the next joint in *Eupronoë armata*, Claus, and other species of *Eupronoë*, in the new species *Parapronoë campbelli*, and in the new genus *Sympronoë*, which includes *Parapronoë parva*, Claus, but in *Parapronoë crustulum*, Claus, and *Parapronoë clausi*, n. sp., this joint is longer than the next following.

Parapronoë campbelli, n. sp. (Pl. CLXXXIX.).

Head and peræon much compressed, head much shorter than peræon, pleon longer than head and peræon together; the first two segments of the pleon with the postero-lateral angles acutely produced, the third segment with the angles not rounded but not produced; the fourth segment not very much shorter than the composite segment which follows; the body flecked with numerous spots of colour, which are orange in the preserved specimens, the first three segments of the pleon inscribed with numerous little longitudinal marks.

Upper Antennæ.—First joint of the peduncle broader than long, the two following joints short, all three strongly marked with hexagonal scale-markings; the first joint of the flagellum rather sharply bent, the upper margin having distally three pairs of filaments, the lower margin very convex, covered with a dense brush of filaments, the rounded apex not produced to the end of the small second joint, which from a narrow neck is a little dilated, and carries on the upper margin two pairs of filaments; the third joint is longer and more slender than the second, and has very near the apex a pair of short filaments.

Lower Antennæ.—The third (first free) joint of the peduncle long, a little curved, more than two-thirds the length of the next joint, the distal part wider than the proximal, the concave margin fringed with little filaments like the corresponding margin of the following joints; the long and narrow fourth joint a little widened at the distal end; the fifth joint a very little shorter than the fourth; the first joint of the flagellum slender, a little curved, scarcely more than half the length of the third joint of the peduncle, the filaments at and near the apex longer than elsewhere; the second joint minute, about a quarter of the breadth of the preceding joint, and scarcely twice as long as broad; to this succeeds a much smaller third joint tipped with three little setules.

Mandibles.—The trunk rather long and narrow, the cutting edge downward bent, with a prominent tooth at the top and another much smaller and sharper at the

other extremity, the intermediate edge strongly striated and minutely denticulate; the left mandible has a secondary plate apparently broad and shallow; each mandible has to the rear of the cutting edge and near the top of it a little blunt spine-like process; the palp is long and slender, all three joints slightly curved, the first not very broad, but broader than the other two, especially at the bend; the third is scarcely longer than the second, these two together being much shorter than the first. The breadth of the cutting edge is considerably less than the length of the third joint of the palp.

Lower Lip.—The plates narrow, tapering, apically acute; the mandibular processes rounded.

First Maxillæ.—Near the base the narrow plate has a projection on the inner side; at some little distance from the narrow smoothly rounded apex, there are four short triangular and equilateral teeth on or a little within the inner margin.

Second Maxillæ.—The distal part of the plate is much narrowed, forming an acute apex, below which there is an emargination longer than deep, and bounded by a little sharp point above facing a rounded angle below.

Maxillipeds.—The inner plate large, of nearly equal breadth and length, the distal margin sinuous; the two central embedded spines not reaching the distal margin, and having below them two much smaller spines; the outer plates distally overlapping one another and overarching the inner plate, showing within the sinuous inner margin five or six small spines.

First Gnathopods.—Side-plates deeper than broad, with front margin a little concave, the lower angle rounded. The first joint having the neck rather narrow and bent, the upper part of the front margin having three little indents; the second joint not longer than broad; the third joint wrist-like, from a narrow neck widening distally to a breadth greater than the length, the front apex almost acute, a little produced, slightly pectinate, the hinder apex widened and more strongly pectinate; the wrist longer and much broader than the hand, widest a little below the wide neck, the hind margin pectinate with sharp not quite regular teeth, three or four of the strongest being on the distal margin; the hand smooth, narrower at the apex than at the neck, attached much nearer to the front than to the hind margin of the wrist, the front margin convex, the hinder a little sinuous; the finger smooth, curved, about half the length of the hand.

Second Gnathopods.—The interlocking process of the segment on the front margin a little way above the side-plate has little grooves leading to a serrate edge; the same form occurs in the following segments. The branchial vesicles of this pair and of the four following pairs of limbs are large, with numerous lateral accessory pockets. The first joint is distally widened, with smooth margins, the front a little sinuous, the hinder convex; the second joint short, the third nearly as in the first pair, but with the apices on a level with one another, neither produced; the wrist with the proximal part about as wide as the third joint but not quite so long and like the third joint having an

extremely minute furring of the hind margin, the apical process large, longer than the base, almost as long as the hand, almost acute, finely pectinate at the upper part of the hind margin, the lower part having nearly twenty teeth, the front or inner margin smooth at the base, then armed with fourteen teeth, which are larger than those on the opposite side; the hand shaped and placed as in the first gnathopods, but with the hind margin near the base finely pectinate, and below more strongly with about twenty small unequal teeth; the finger not half the length of the hand.

First Peræopods.—First joint similar to that of the second gnathopods, but narrower above and more widened below; the second joint rather longer than broad; the third with narrow neck, then much widened and distally scarcely narrowed, the front margin convex, with the apex rounded; the fourth joint narrower than the third and very slightly longer, smooth, a little curved, the distal margin finely pectinate; the fifth joint narrower than the fourth, of about the same length, finely pectinate along the hind margin, within which there are also five minute spinules; the finger curved, scarcely a third the length of the fifth joint.

Second Peræopods.—The first and second joints narrower than in the preceding pair, the three following joints longer and narrower; the third joint strongly bent, the front margin convex, the hinder concave, both smooth; the fourth joint a little longer and narrower, also smooth, slightly curved; the fifth joint slender, almost as long as the fourth, with six microscopic spinules along the slightly furred hind margin and some very fine pectination at the distal extremity; the finger less than a quarter of the length of the first joint.

Third Peræopods.—The side-plates with a curved tongue-like backward directed process on the inner side. The first joint a sort of oblong or long oval, about two and a half times as long as the greatest breadth, which is rather below the middle, not quite equal in length to the following joints together, the front margin nearly straight, with a little shallow serration of the lower part, the surface adjoining the front margin marked with seven or eight more or less parallel longitudinal lines, the distal margin somewhat flattened, the surface above this marked with some little oblique curved lines; the second joint longer than broad, so placed as not to be able to reach either the distal or the hinder margin of the large first joint; the third joint more than twice as long as the second, the hinder apex a little produced, almost acute, pectinate, the front margin at first smooth, then feebly and by degrees more strongly pectinate; the fourth joint about once and a half as long as the third, a little narrowed distally, all the front margin pectinate; the fifth joint much narrower than the fourth, almost as long, a little bulb forming the hinge, the hind margin smooth, produced into a small apical tooth, the whole front margin pectinate, the teeth become smaller towards the narrow apex, of which the margin is also finely fringed; the finger about a fifth of the length of the fifth joint.

Fourth Peræopods.—Branchial vesicles with a second lobe to the rear of the larger front portion. The first joint scarcely longer than in the preceding pair, and distally narrower, but above much broader, the hind margin smooth, convex, the long tongue-like distal part not reaching quite so low as the distal part of the front; the front margin almost straight, very slightly concave below, with an almost pointed apex, behind which the short distal margin slopes downwards to the more rounded apex of the long slit, a little in front of which the inner surface is grooved; the joint nearly twice as long as all the remaining joints together; the short second joint is placed at the top of the slit which divides the apical part of the first; the third joint is as long as the fourth and fifth together, the proximal part broader and rather longer than the fourth joint, the front apical process more than half the length of that joint, the hind margin smooth, with a short produced apex, the front margin strongly pectinate from one end to the other, and having small teeth between the large ones; the fourth joint broader and longer than the fifth, pectinate like the third but less strongly; the fifth joint finely pectinate with decurrent teeth along the front margin and round the apex, the hind margin produced into a little tooth; the finger minute, not curved, but a little crooked.

Fifth Peræopods.—Side-plates with a very long hind margin, forming an acute apex. The first joint at the upper part more than half the breadth of the first joint of the preceding pair, and more than half as long as that joint, the apex behind rather broadly rounded; the very minute second joint longer than broad; the third joint shorter than the second and a little narrower, a little longer than broad, smoothly rounded distally.

Pleopods.—Peduncles stout; the coupling spines small, with only the apical retroverted teeth; the cleft spine having a subapical unsymmetrical dilatation of the longer arm, the backward serrature of the shorter arm being strongly marked; as in the genus *Eupronoë*, the first joint of the inner ramus has several plumose setæ below the cleft spine, in the present specimen as many as six; the first joint of the outer ramus has also several plumose setæ; the joints of the rami from twelve to thirteen in number.

Uropods.—Peduncles of the first pair shorter than the rami, three-edged, the inner margin with a produced acute apex; the outer ramus three-edged, shorter than the inner, both with the margins strongly pectinate, except near the bases and the acute apices, the teeth larger and less numerous on the inner than on the outer margin; the peduncles of the second pair nearly as long as those of the first, the rami broader and rather longer, the outer ramus nearly as long as the inner, its outer margin forming only a few little distant teeth, the pectination otherwise as in the first pair; peduncles of the third pair very short, broader than long, the inner margin with a produced acute apex; the rami rather shorter than in the two preceding pairs, the outer a little shorter than the inner, with the outer margin smooth, the inner strongly pectinate except at the two extremities; the inner ramus with almost smooth margins, distally pectinate very minutely, the apex acute.

Telson long and tongue-like, more than twice as long as broad, nearly as long as the preceding composite segment and not much shorter than the third uropods, the sides gently convex, the apex acute; there are many little curved lines across this and various other parts of the animal.

Length.—From the front of the head to the end of the first segment of the pleon about a quarter of an inch, the total length about two-fifths of an inch.

Locality.—July 1875, between Japan and Honolulu; lat. 35° N.; surface. Six specimens; the specimen described, a male.

Remark.—The specific name is given in compliment to Lord George Campbell, the author of the very entertaining work, Log Letters from the Challenger.

Parapronoë clausi, n. sp. (Pl. CXC.).

Head large, rounded; the postero-lateral angles of the first three pleon-segments not rounded but scarcely or not produced, the lower margin in the first interrupted, the hinder part starting from the inner surface a little above the termination of the front part; the fourth segment considerably shorter than the following composite segment; the body spotted with numerous small orange spots.

Upper Antennæ nearly as in *Parapronoë campbelli*, but the rounded apex of the first joint of the flagellum not at all produced, the small second almost as long as the much narrower third joint, and carrying filaments at three points of the upper margin.

Lower Antennæ differing much from those of *Parapronoë campbelli*, and agreeing with those of *Parapronoë crustulum*, Claus; the gland-cone projecting from the wall of the head (see fig. *g.c.*); the third (first free) joint of the peduncle much longer than the fourth, the fourth a little longer than the fifth; the first joint of the flagellum not more than a third of the length of the last joint of the peduncle, narrow at each end; the second joint very short and slender, the third still more minute; all the joints fringed with short filaments, except the third joint of the flagellum which is tipped with little hairs or setules.

Upper Lip semicircular.

Mandibles.—The trunk long, nearly straight, but upward bent at the base and with very sinuous lower margin; the cutting edge forming part of the lower margin, very broad, convex, strongly striated, and finely denticulate, with a blunt tooth at the upper or front corner, in the rear of which there is a groove on the surface ending in a small tubercle; to the left mandible there is a long shallow secondary plate, similar to the principal but without the upper tooth; the palp has a large strongly bent first joint, very much longer than the two following joints together; the second rather longer than the third. The breadth of the cutting edge much exceeds the length of the third joint of the palp.

Lower Lip of very thin texture, the plates curved, rather narrow, tapering to an acute apex, very minutely furred; the mandibular processes produced, apically rounded.

First Maxillæ nearly as in *Parapronoë campbelli*, but the apex more acute, the four marginal teeth more blunt.

Second Maxillæ shorter than the first, divergent at the base, then closely united as far as the small projecting tooth or angle of the inner surface, then again diverging to the nearly acute apex, the inner margin of each plate at this part having a little fold and a setule near it.

Maxillipeds nearly as in the species above named, but the inner plate less broad, with a rather deep central indent on the distal margin, from which the sides slope away; the outer plates broad at the base, the spines within the inner margin less numerous or less conspicuous than in the other species. The boat-shaped appearance of these organs is not indicated by the outline figures.

First Gnathopods.—Side-plates deeper in front than behind, with a diagonal ridge directed to the lower front corner. The limb differing in many points from that of *Parapronoë campbelli;* the first joint with the upper part of the front margin pectinate; the wrist widens immediately from the broad neck, then narrows so that the distal end is narrower than the neck, and projects scarcely more behind the hand than in front of it, the hind margin very sinuous, pectinate, the short distal margin behind the hand being also pectinate with fine teeth; the hand is longer than the wrist; the finger half the length of the hand, bulbous at the base, the inner margin rather sinuous.

Second Gnathopods differing from those of *Parapronoë campbelli* in having the first joint not bent, the hind margin of the wrist pectinate for a greater distance, its apex acute and a little incurved, the irregularly pectinate inner or front margin of the distal process very sinuous, at the base standing away from the hand, then bending towards it and again away from it; the hand is rather shorter than in the first pair but broader, bent at the neck, then having both margins convex, the hinder pectinate, the apex rather abruptly narrowed; the finger more than half the length of the hand, with concave inner margin.

First and Second Peræopods scarcely differing in pattern from those of *Parapronoë campbelli*, except that in the first joint the lower part of the front margin is a little concave; the fourth and fifth joints in both are finely pectinate.

Third Peræopods.—Side-plates almost semicircular, but bilobed, the circumference being interrupted where the smaller front lobe meets the hinder; on the inner surface as usual a bent tongue-like process is directed backwards. The first joint very large, as it were five-sided, the front margin being obtusely angled, the lower part not so long as the upper, with a slight serration, the hind margin nearly straight, with the corners strongly rounded, the lower margin between them straight; a tract in front marked

with parallel lines longitudinally, the lines at the broadest part being about twenty in number; the remaining joints nearly as in *Parapronoë campbelli;* the fifth joint rather longer than the fourth.

Fourth Peræopods.—The first joint not much longer or even much broader than in the preceding pair, not nearly twice as long as broad, the front margin bulging a little near the base, slightly channelled, for the most part straight, serrate near the short sinuous apical margin; the very convex hind margin much longer than the front, rising much above it, and the tongue-like apex (in one of the specimens examined) descending a little below it; the groove of the inner surface in front of the straight slit has a sinuous margin; the remaining joints are nearly as in *Parapronoë campbelli*, but the fifth joint more curved; the finger extremely minute, retractile within the pectinate apex of the preceding joint.

Fifth Peræopods.—The first joint pear-shaped, not as long as the breadth of the first joint in the fourth pair, sometimes as in the other species with an indent low down on the front margin, the rounded apex behind produced a little; the minute second joint very little longer than broad; the third joint longer than the second, nearly twice as long as broad, the apex rounded.

Pleopods.—Coupling spines very short; cleft spine with very short arms, the longer arm with a small subapical dilatation; there are several plumose setæ on the first joint of the inner ramus below the cleft spine, and eight on the outer margin of the outer ramus; the joints of the rami fourteen or fifteen in number.

Uropods.—Peduncles of the first pair shorter than the rami; the outer ramus a little shorter than the inner, its outer margin closely pectinate except close to the base and the acute apex, the inner margin with the pectination looser, beginning below the centre, and not approaching so closely to the apex; the inner ramus with the upper half of the outer margin smooth, the lower half as in the outer ramus, the inner margin with the pectination carried rather higher up than in the outer ramus; the peduncles of the second pair decidedly shorter than those of the first, the rami of nearly the same length as in that pair but broader and narrowing much more abruptly at the apex; the outer ramus rather shorter than the outer of the first pair, its outer margin almost smooth, with five little indents at the lower part, the inner margin pectinate at the lower part; the inner ramus about as long as the inner of the first pair, with both margins pectinate on the lower part; the peduncles of the third pair very short, broader than long; the outer ramus considerably shorter than the inner, with the outer margin smooth except for a single indent, the inner margin for the most part pectinate; the inner ramus longer than the telson, very loosely pectinate on both margins, more strongly on the inner than on the outer, and on the lower than on the upper part, the apex (in the specimen, not acute.

Telson triangular, elongate, reaching beyond the outer ramus of the third

uropods, but not nearly to the apex of the inner ramus, the length nearly twice the breadth at the base, the apex not quite acute.

Length, about half an inch, when fully extended.

Localities.—March 15, 1874, south of Australia; lat. 39° 45′ S., long. 140° 40′ E.; surface; surface temperature, 60°·2. Ten specimens.

October 1875, South Pacific, surface. Five specimens. The specimen examined was a male, and differed from the specimen above described in having the third joint of the fifth peræopods distally narrowed, almost acute.

Remarks.—The specific name is given in compliment to the distinguished zoologist, to whose highly important work, Die Platysceliden, reference has been so frequently made. The present species has many points of resemblance to *Parapronoë crustulum*, Claus, from "the Atlantic Ocean, Lagos, Zanzibar"; it differs from that species in the shape of the wrist of the first gnathopods, in the more irregular inner margin to the wrist process of the second gnathopods, in the more produced third joint of the fourth peræopods, and in the widened rami of the second uropods.

Parapronoë clausoides, n. sp. (Pl. CXCI.).

This species seems to unite some of the characters of *Parapronoë clausi*, just described, with some of those of *Parapronoë crustulum*, to be described presently. The head is large and rounded; the first three pleon-segments have the postero-lateral angles acutely produced, that of the first segment most strongly, the lower margin being excavate in front of the tooth; the fourth segment is much shorter than the composite following segment; the body quite free from spots of colour, and in this respect differing from both the species above mentioned.

The Upper Antennæ are those characteristic of the female; the first joint of the peduncle longer than broad, with sinuous margins, the second short, broader than long; the long first joint of the flagellum somewhat curved and tapering, carrying on the concave margin nine pairs of filaments; the second joint of the flagellum is much more slender than the first and less than half as long; the third much more slender than the second, more than half as long.

Lower Antennæ.—The gland-cone prominent; of the four free joints, which are slender and not folded, the first is longer than the two following together, the third a very little longer than the second, and the fourth than the third.

The Mandibles are of the usual character, but in the female without palp. The figure *m.m.* represents them drawn apart at the bases but with the distal ends and the outermost teeth of the cutting plates overlapping, close to the small almost semicircular upper lip.

The Maxillæ and *Maxillipeds* presented no specially distinctive features.

The Gnathopods are like those of *Parapronoë crustulum*, differing therefore from those of *Parapronoë clausi*.

The First, Second, and *Third Peræopods* as in the two compared species.

Fourth Peræopods.—The front and hinder apices of the first joint on a level; the third joint as in *Parapronoë clausi*, with the process more than half the length of the fourth joint, not less than half that of *Parapronoë crustulum;* the finger minute.

Fifth Peræopods with the second joint much shorter than the third, which is longer than that in *Parapronoë clausi*, the end of the first joint being also more broadly rounded in this species than in that.

Uropods.—The first two pairs very nearly as in the two other species, but the peduncles of the second pair less differing in length from those of the first pair; the rami of the third pair subequal in length, both of them broad, the chief narrowing not beginning till near the apex, the outer armed as in *Parapronoë crustulum*, the inner with smooth outer margin, the inner margin smooth along the upper half, then faintly pectinate and more strongly near the apex.

Telson nearly as long as the third uropods, nearly twice as long as the breadth at the base, not regularly triangular, since the sides converge near the apex much more rapidly than in the upper part; the apex is blunt.

Length, fully extended, over half an inch.

Locality.—June, 1874; between Sydney and Wellington; surface.

Remarks.—The specific name points to the likeness between this species and that named *Parapronoë clausi*. From *Parapronoë crustulum*, Claus, it is distinguished by the more prolonged third joint in the fourth peræopods, the two terminal joints of the fifth peræopods, and by characters of the uropods and telson.

Parapronoë crustulum, Claus (Pl. CXCIII., A.).

1879. *Parapronoë crustulum*, Claus, Die Gattungen und Arten der Platysceliden, p. 31.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 42.
1887. „ „ Claus, Die Platysceliden, p. 55, Taf. xv. fig. 1–15.

Head rounded; the postero-lateral angles of the first two pleon-segments acutely outdrawn, of the third segment squared, the lower margin of the first segment deeply emarginate, so as to form a second angle below and in front of the postero-lateral angle; the fourth segment much shorter than the following composite segment; the whole body except the head dotted with little dark spots.

Eyes extremely dark.

Lower Antennæ.—Gland-cone very prominent; third (first free) joint of the peduncle curved, a very little longer than the fourth joint, which is distally a little curved in the opposite direction; the fifth joint about four-fifths the length of the fourth; the slender first joint of the flagellum considerably less than half the length of the last joint of the peduncle, the second and third joints quite minute.

Mandibles.—The left mandible with a very prominent tooth at the top or front of the long straight cutting edge, the secondary plate not much shorter than the principal, a minute tubercle on the surface adjoining its hind margin; the cutting edge on the right mandible more convex; the first joint of the palp very long, curved, not very broad, the second and third joints subequal in length, together much shorter than the first, the third more slender than the second.

Maxillæ of the usual pattern, the second pair much smaller than the first.

Maxillipeds.—The distal margin of the inner plate very sinuous, the outer plates broad and long.

First Gnathopods.—The side-plates with the lower front angle acute, with a diagonal ridge of the under surface directed to it. The first joint pretty evenly broad except at the neck, the front margin indented at the top and microscopically pectinate; the third joint widening greatly from the narrow neck, so that the distal breadth is much greater than the length of the joint, the convex hind margin pectinate on the lower half, the front forming a rounded apex, the distal margin extremely sinuous; the wrist widening immediately from the broad neck to a breadth a little less than that of the third joint, then narrowing greatly, so as to project but little behind the hand and scarcely at all in front, the sinuous hind margin longer than the front, pectinate, the hinder part of the distal margin pectinate with three or four little teeth; the hand smooth, shorter than the wrist, its length equalling or little exceeding the wrist's greatest breadth; the finger about a third of the length of the hand.

Second Gnathopods.—The first joint with the front margin nearly straight; the third joint a little longer than in the first gnathopods; the wrist pectinate with six little teeth on the round front apex, the triangular process behind shorter than the trunk, broad at the base, shorter than the hand, pectinate on both margins, the pectination of the hind margin continued some way up the trunk of the joint; the hand rather widened at the centre, pectinate along the hind margin; the finger scarcely more than a third of the length of the hand.

First and Second Peræopods as in *Parapronoë clausi.*

Third Peræopods like those of *Parapronoë clausi*, but the bent process within the side-plates is more narrowly produced, and the fifth joint is more decidedly longer than the fourth.

Fourth Peræopods very near to those of the species just mentioned; the two limbs of the specimen differ slightly in regard to the first joint, since in one the apex of the

hind margin does not reach quite so low as that of the front, while in the other the two apices are on a level; the produced apex of the third joint is rather less instead of rather more than half the length of the fourth joint; the finger is minute.

Fifth Peræopods differing chiefly from those of the species just mentioned by having only two joints, the second or terminal joint minute, a little longer than broad, directed backwards, the front margin convex, the hinder nearly straight, with a small incision high up, probably indicating an original division of the joint into two. The shape of the male organs on the ventral surface of the seventh peræon-segment is shown in the figure *prp*^{5}.

Pleopods.—The spines as in the other species; the joints of the rami about fifteen in number, the first joint not very long.

Uropods.—The first two pairs as in *Parapronoë clausi*, the pectination here seen to be continued, though not strongly, up the inner margin of both rami of the second pair; the outer ramus of the third pair almost as long as the inner, with two or three little indents on the outer margin, the inner margin pectinate except near the base and at the apex; the inner ramus with smooth outer margin, the lower half of the inner pectinate with little close-set teeth, not as in *Parapronoë clausi* with comparatively large teeth wide apart.

Telson twice as long as the breadth at the base, almost as long as the third uropods.

Length, to the end of the second pleon-segment, a little over two-fifths of an inch.

Localities.—Pacific, between Papua and Japan, surface. One specimen, male, to which the above description applies.

North Atlantic, between Tenerife and St. Thomas, West Indies; surface. One specimen.

April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. One specimen, male.

April 28, 1876, North Atlantic; lat. 17° 47′ N., long., 28° 28′ W.; surface; surface temperature, 73°·5. One specimen.

Atlantic, surface. One specimen.

Remarks.—The specimen taken April 29, 1876, measured about seven-tenths of an inch in length; in the fifth peræopods the distal end of the first joint is rather flattened than rounded, not at all produced, and is followed by *two* minute joints, very narrow, about equal to one another in length; the postero-lateral angles of the third pleon-segment are a little outdrawn. Claus figures the fifth peræopods with only one appendicular joint, but this character is probably variable; the relative lengths of the joints of the lower antennæ are also most likely subject to some variation. The resemblance in almost all details is so exact between the Pacific and Atlantic specimens, that the very small points of difference do not seem to justify specific distinction.

Genus *Sympronoë*, n. gen.

Near to *Parapronoë*.

First Gnathopods simple, the wrist supplying no approach to a palm.

Second Gnathopods complexly subchelate, the process of the wrist short and more or less obtuse.

Fifth Peræopods with the first joint not much expanded above and distally much narrowed; the two terminal joints minute.

Uropods of the first and second pairs as in *Parapronoë* with the rami acute; the rami of the third pair short, broad, ending obtusely.

Telson very short.

The name is derived from the Greek *σύν*, with, and *Pronoe*, the name of the leading genus in the family Pronoidæ. Claus, in his observations on the genus *Parapronoë*, says that though the first gnathopods are simple, the wrist is so expanded that the limb might be characterised as complexly subchelate. This, which applies well to *Parapronoë crustulum*, is unsuited to the species of *Sympronoë*. Unfortunately Claus has not described the first gnathopods of his *Parapronoë parva*, which must undoubtedly be included in the new genus. He remarks of the first maxillæ of *Parapronoë* that the apex reaches far beyond the four submarginal teeth, which again is true of *Parapronoë crustulum*, but does not apply to *Sympronoë*.

Sympronoë parva (Claus) (Pl. CXCII.).

1879. *Parapronoë parva*, Claus, Die Gattungen und Arten der Platysceliden, p. 31.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 42.
1887. „ „ Claus, Die Platysceliden, p. 55, Taf. xiv. fig. 13–18.

Length and depth of the head about equal; in a lateral view the lower part of the front curve of the head becomes a little concave, where the upper antennæ project; the rostral point is obtusely angled between the upper antennæ; the fifth is the longest of the peræon-segments; the first three segments of the pleon are large, squared at the postero-lateral angles; the coalesced fifth and sixth segments form one that is considerably longer than the fourth, narrowing gradually towards the distal end. The skin of the specimen with the usual hexagonal markings, but also more or less covered with larger and smaller circles as if of a crystalline coating, and spotted with orange in many parts.

The Eyes occupy most of the head, but do not reach the front or lower margin.[1]

Upper Antennæ.—The first joint of the peduncle widening distally, as broad as long, the second and third joints incompletely developed; the first joint of the flagellum very

[1] This limitation, however, may not apply to living specimens.

strongly convex on the lower or outer side, the apex rounded, not produced, the fringing brush formed by some fifty rows of filaments, the much shorter upper margin having filaments only at the apex; the second joint small, twice as long as broad, with two groups of filaments on the upper margin; the third joint rather shorter and much narrower; the fourth linear, rather longer than the second or third.

Lower Antennæ.—The gland-cone prominent; the third (first free) joint long, bent near the base, distally widened; the fourth and fifth joints equal in length, each considerably longer than the third; the first joint of the flagellum slender, curved, more than half as long as the third joint of the peduncle, less than half the fourth or fifth; the second joint minute, but like the others fringed on one side with short filaments; at its tip there is, as in the species of the neighbouring genus *Parapronoë*, a much more minute third joint.

Mandibles.—The cutting edge forming the distal part of the sinuous lower margin, slightly convex, with a finely striated and denticulate edge, and a prominent blunt tooth at the upper or front apex; the secondary plate of the left mandible rounded at its front apex, but having a small projecting tooth at the hinder one; in each mandible there is as usual a small process on the inner surface to the rear of the cutting plate; it is in this species placed well forward and quite blunt; the first joint of the palp not much longer than the other two together; the second much thinner than the first, the third a little thinner than the second, subequal to it in length, rather more strongly curved than the other two. The cutting edge is rather shorter than the third joint of the palp.

First Maxillæ.—The four teeth on the inner margin are very blunt, and the distal one is very near to the apex of the plate.

Maxillipeds.—The boat-shaped outer plates arching over the inner plate, their sinuous inner margins leaving an oval space between their apices and the inner plate's distal border, each plate having on its outer surface a row of eight or ten small setules; the distal border of the inner plate sinuous, cleft at its centre down to the sockets of the embedded setules, on either side of which there are a couple of inward pointing spinules.

First Gnathopods.—Side-plates deeper before than behind, a little pointed in front below. The first joint almost free from the side-plate, both margins convex for nearly the whole length, the front of great tenuity, with some extremely minute pectination; the second joint as broad as long; the third widest distally, shorter than the wrist but about as long as the hand; the wrist not quite so wide as the third joint, narrowing a little distally, the pectination of the hind margin of this and the preceding joint extremely minute; the hand abruptly narrower than the wrist, but attached to the centre of its distal margin, so that there is only a small free portion of that margin on either side of it, and nothing in any way suggestive of a palm; the hand is narrow, a little curved, the front margin convex, the hinder slightly sinuous; the finger very small and slender, slightly curved, less than half the length of the hand.

Second Gnathopods.—Side-plates tending to oblong, but broader above than below. Branchial vesicles longer and much broader than the first joint, with the usual lateral accessory inflations. The first joint not dilated distally, the front margin tending to convex; the second joint as broad as long; the third larger than in the first gnathopods, its front margin considerably longer than that of the wrist, the hinder not quite so long as that of the wrist, the rounded apices finely pectinate, the front one being the broader, the hinder the more strongly pectinate; the wrist, which is widest at its junction with the hand, is produced behind in a rounded process about half the length of the hand; the hind margin is pectinate, very finely at first, but more boldly as the pectination approaches and passes round the process; the hand as in the first gnathopods, but a little broader at the base; the finger is scarcely so long as in the preceding pair.

First Peræopods.—The side-plates a little less regular than in the preceding pair; the branchial vesicles similar; the first joint rather longer, with both margins very slightly convex; the second joint rather longer than broad; the third joint decidedly broader and a little longer than the fourth, narrowing distally to a very slight extent, the rounded corners of the distal margin finely pectinate; the fourth joint narrowing a little distally, wider than, but scarcely so long as, the fifth joint, which narrows a good deal distally; the finger is slender, curved, acute, not a third the length of the fifth joint. The limb figured in the Plate does not agree with the above proportions, but was probably abnormal.

Second Peræopods similar to the first, but with the joints a little longer, the fourth as long as the third, the finger scarcely one-fourth the length of the fifth joint.

Third Peræopods.—Side-plates broader than deep, both lobes squared, the hinder one the larger; the triangular tooth-like process on the inner side has its lower margin convex. Branchial vesicles much broader above than below. The first joint oval, with a very regular hind margin, the front rather less so; the second joint short, some little way from the distal end of the first; the third joint subequal in length to the fourth, the two together not reaching back to the base of the first, each with closely pectinate front margin; the fifth joint narrow, a little curved, rather longer than the fourth, its front margin with the fine pectination oblique, not standing out as in the two preceding joints, the apex pectinate; the finger very small and slender.

Fourth Peræopods.—Side-plates not broader than deep, deeper behind than in front. Branchial vesicles with a second lobe above, the larger front division very much narrowed below. The first joint a little longer than that of the third peræopods, its upper half a little broader than that at the centre, but narrowing rapidly to the apex, the front margin almost straight, tending rather to concave than convex except at the two ends, the hind margin at first convex, then oblique; the distal margin is broken by the short longitudinal slit, behind which the joint forms an almost pointed apex, while in front it carries on the inner surface a blunt process, and below this a pointed process, reaching together

with the rounded front apex below the hinder apex; at the top of the slit rises the short second joint, partially overlapped by a third process; the third joint is long, with the front margin longer than the hind one, strongly pectinate, forming a triangular process with smooth hind margin nearly halfway along the front of the much narrower fourth joint, which is pectinate with much smaller teeth; the fifth joint is minutely pectinate, narrower and shorter than the fourth, the two together equalling the length of the third; the finger is quite minute, sharp, no doubt retractile within the pectinate apex of the fifth joint, not nearly reaching to the base of the first joint.

Fifth Peræopods.—Side-plates rather deeper than broad, deeper behind than in front. The first joint a good deal more than half as long, and less than half as broad as the first joint in the fourth peræopods, the front margin nearly straight, the hinder at first parallel, then sinuously sloping to a very narrow apex; there is a ridge nearer to the front than the hind margin, and nearly parallel with it, reaching below the middle of the joint; the second joint is minute, with slightly convex front margin; the third joint is about as long, but scarcely so broad as the second; it curves backwards, with convex front and nearly straight hind margin.

Pleopods.—The two coupling spines are small, with the usual caps; in the cleft spine the subapical dilatation is very small; the joints of the rami number ten and eleven.

Uropods.—The first pair have the peduncles scarcely so long as the rami, the rami long, lanceolate, reaching a little beyond the second pair, and not quite so far as the apices of the third, the margins cut into teeth, those on the inner margin being rather longer than those on the outer, and not approaching quite so closely to the acute apex, the outer ramus like the peduncles three-edged; the peduncles of the second pair are shorter than those of the first, but reach as far back, with the inner apex acutely produced; the rami are not much shorter than those of the first pair, the inner longer and considerably broader than the outer, with both margins cut into teeth, the outer with only the inner margin so ornamented; the peduncles of the third pair are very short, broader than long, the slightly produced inner apices of the two peduncles nearly meeting; the rami are shorter than the preceding pairs, the outer scarcely shorter, but considerably narrower than the inner, having the lower two-thirds of its inner margin cut into long teeth, more than twenty in number, the apex narrowly rounded; the inner ramus is oval, but with a flattened base and the greatest width near the base; the edges are smooth; the inner ramus of one pair partially overlaps that of the other pair.

Telson small, about as broad as long, about half an oval with a slightly convex base; the distal portion overlaps the upper inner corners of the inner rami of the third uropods.

Length.—The specimen in the position figured, measured, in a straight line from end to end, one-fifth of an inch.

Localities.—February 6–7, 1875, south of Mindanao, Celebes Sea; lat. 6° 20′ N., long. 123° 18′ E.; surface at night; surface temperature, 81°·7. One specimen, male.

Station 206, January 8, 1875; China Sea, off Luzon; lat. 17° 54′ N., long. 117° 14′ E.; surface; surface temperature, 75°·2. Three specimens.

Remark.—The specimen described by Claus was from Zanzibar.

Sympronoë propinqua, n. sp. (Pl. CXCIII., B.).

The postero-lateral angles of the first three pleon-segments not acute, the lower margin of the first excavate behind; the fourth segment much shorter than the following composite segment; the body flecked with numerous dark spots.

Upper Antennæ as in the preceding species.

Lower Antennæ.—Gland-cone prominent; third (first free) joint of the peduncle much curved, the fifth joint longer than the fourth; the first joint of the flagellum less than half as long as the last of the peduncle, the following joint minute.

Gnathopods and first four pairs of *Peræopods* closely resembling those of the preceding species.

Fifth Peræopods.—The first joint rather abruptly narrowed distally, the apex narrowly produced behind the little second joint, which in its turn is produced so as to overlap the upper half of the third joint; the third joint is scarcely so long as the second, bent backwards.

Pleopods.—The coupling spines and cleft spine as in the other species; the joints of the rami from ten to twelve in number.

Uropods scarcely differing from those of *Sympronoë parva*, yet the inner ramus in the third pair broader, and a little more produced beyond the outer.

Telson less broadly rounded distally than in the species just named.

Length, about a fifth of an inch.

Locality.—October 5, 1873, South Atlantic; lat. 29° 1′ S., long. 28° 59′ W.; surface, night; surface temperature, 65°·2. One specimen, male.

Remarks.—The specific name refers to the near approach which this species makes to *Sympronoë parva* (Claus), from Zanzibar and the Pacific.

A specimen, three-tenths of an inch long, evidently belonging to this genus, was taken at Station 201, October 26, 1874; off Basilan Strait; lat. 7° 3′ N., long. 121° 48′ E.; surface; surface temperature, 83°. This specimen probably belongs to a species distinct from those that have been described, differing chiefly in the first joints of the third and fourth peræopods.

Family Tryphanidæ, Boeck, 1870.

This family was instituted by Boeck in 1870 for the single genus *Tryphana*. Bovallius in 1887, altering the name of the genus to *Tryphæna*, at the same time calls the family Tryphænidæ, with the following definition:[1]—

"Head large, more or less globular, tumid. Eyes large, occupying the sides of the head. First pair of antennæ curved, fixed at the inferior side of the head, with the first joint of the flagellum tumid, the following subterminal, few-jointed. Second pair fixed at the inferior side of the head, angularly folded (in the male) or wanting (in the female). Mandibles with palp (in the male) or wanting palp (in the female). Seventh pair of pereiopoda [*Fifth Peræopods*] are not transformed. Peduncles of the uropoda normal."

Claus in 1879 and 1887, not taking note of the genus *Tryphana*, which had been by some writers identified with *Lycæa*, named the family Lycæidæ, and in 1879 gave the following definition:—

"Body less broad [than in the Typhidæ], *Hyperia*-like, in the female more compact. Pleon powerfully developed, half flexing. The laminar first joints of the third and fourth peræopods relatively small and triangular, like one another, covering only a part of the ventral surface. Fifth peræopods weak, but with the full number of joints. In the female the hinder antennæ are for the most part completely obsolete. Maxillæ reduced. Two otolith-vesicles present." In 1887 he adds the character:—"Branchial vesicles with lateral accessory compartments."

Genus *Tryphana*, Boeck, 1870.

1870. *Tryphana*, Boeck, Crust. Amph. bor. et arct., p. 9.
1872. „ Boeck, De Skand. og Arkt. Amph., p. 91.
1882. *Lycæa*, Sars, Oversigt af Norges Crustaceer, pp. 20, 76.
1886. *Tryphana*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 489.
1887. *Tryphæna*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 30.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 572.

For the original definition of the genus, see Note on Boeck, 1870 (p. 397).

From Boeck's description of the lower antennæ, which in the character of the family he says are "parvulæ," and for which he only mentions three joints in describing *Tryphana malmii*, and from his statement that the mandibles are without palp, it may be presumed that he was acquainted only with a male specimen not fully adult, since according to the family character formulated by Bovallius the lower antennæ are wanting in the female, while on the other hand the mandibular palp is present in the adult male. Bovallius, in his Arctic and Antarctic Hyperids, observes:—"The genus

[1] Arctic and Antarctic Hyperids, p. 572.

is at once distinguished from the other Hyperidean genera by the form of the last joint of the flagellum of the first pair of antennæ and by the peculiar armature of the second pair of pereiopoda [*Second Gnathopods*]. In other respects it forms a link between the Hyperidean and the Platyscelidean groups of the tribe." He does not, however, describe "the last joint of the flagellum of the first pair of antennæ," which is by no means the same in the new species, *Tryphana boecki*, as that described and figured by Boeck for *Tryphana malmii*. Gerstaecker, who in 1886 rightly kept this genus distinct from *Lycæa*, in his definition leaves the eyes doubtful "(Augen ?)," but this doubt was needless, since Boeck in the description of the type-species had expressly said that the eyes occupy the whole sides of the head.

Tryphana boecki, n. sp. (Pl. CXCIV.).

Head deeper than long, as long as the first three or four segments of the peræon; head and peræon together shorter than the pleon; first three segments of the pleon large, the postero-lateral angles almost right angles, the acute points being minute; all parts of the animal having dark spots very irregularly distributed, on the whole not very numerous.

Eyes occupying all the sides of the head, with large and elongate pigment-mass.

Upper Antennæ attached in front to the under side of the head; the first joint of the peduncle widening abruptly from a narrow attachment, widening distally, not longer than broad, the two following joints short, their outlines rather indistinct except at the upper edge; the first joint of the flagellum short and broad, little convex on the upper edge, otherwise almost circular, the filaments of the brush round the lower edge being longer than the joint; the second joint longer than the first, within the slightly projecting apex of which it is attached, slender, its width distally for a third (or sometimes more) of the length being abruptly reduced to less than half that of the proximal part, the long lower margin having ten little groups of setules, and the truncate apex a bunch of them; the shorter upper margin has at its apex a long spine with two little hairs at the blunt tip, this spine probably being the third joint; between this spine-like third joint and the produced lower part of the second joint there is a very small process, not longer than broad, its distal margin occupied by three filaments, which reach to the end of the third joint.

Lower Antennæ attached at the back of the head; the gland-cone only slightly projecting, the joint which bears it being partially free; the following or third joint of the peduncle visible outside the lower part of the hind margin of the head, broad, somewhat oval, two or three times as long as broad, the edges smooth; the fourth joint much narrower, not twice as long, narrowed a little from the base, the distal part widest, closely fringed with short filaments on the inner edge, and with nine or ten distant cilia

on the outer edge; the fifth joint similar, of nearly equal length, narrower, with only one cilium on the outer edge near the distal end; the first joint of the flagellum abruptly narrower than the last of the peduncle and considerably longer; the second joint still more slender, folded closely back against the first and perhaps nearly half its length; the two joints of the flagellum are so delicate and so closely fitted into a groove of the head that it is very difficult to draw them out without breaking them.

Epistome conical; *Upper Lip* shallow, bilobed.

Mandibles with a narrow trunk bent about at a right angle in front, the cutting edge having a sharp produced tooth at the top and a sinuous front margin, part of which is very finely denticulate; the secondary plate on the left mandible a little widened distally with its front edge finely denticulate; the bent front portion of the mandibles presents a fold or thickening of the inner surface, with a spine-like projection at the rear end; the three-jointed palp is large, placed well forward on the top of the angle of the trunk, the first joint rather longer than the following two together, and except at the extremities much broader; the second joint narrowly oval, a little wider, but rather shorter than the apically acute third joint; these two joints are very easily detached from the first.

First Maxillæ.—A narrow rectangular lamina much longer than broad, apically a little pectinate, and of very thin texture, appears to constitute the first maxilla.

Second Maxillæ.—These appear to be like the first pair, except that the plate is broader and not apically pectinate. The delicacy of these organs makes it difficult to separate them from the maxillipeds and mandibles without injury or distortion, the bases of all being pretty firmly united.

Maxillipeds broadly boat-shaped, the first joint narrow, the second very broad; the inner plate with a small depression in the centre of the distal margin, a small embedded spine on either side of and below the depression, and a little lower down a pair of spinules; the outer margin of the plate, as also the margin of an inner ridge, is finely pectinate; the outer plates are broad at the base, apically narrow, the outer margin convex, the inner very sinuous, minutely pectinate, except at a little emargination not far from the apex; the surface shows three minute spinules.

First Gnathopods.—Side-plates small, with a downward produced lobe in front. First joint widely expanded in front, not much longer than broad, the hind margin nearly straight, but the front very convex; the second joint small, not longer than broad; the third joint not longer than the second, and as seen from the outer side not so long, apically pointed, the hind margin carrying two small distally feathered spines; the wrist about half as wide as the first joint, but about twice as wide and nearly twice as long as the third joint, with three distally feathered spines at the apex of the straight hind margin, the front margin convex; the hand, including the acutely produced feathered process which forms the hinder apex, is equal in length to the wrist, but much

narrower, having a feathered spine on each margin; the finger half the length of the hand, very narrow, feathered, with a very sharp nail; in one example the finger was bent as if impinging against the apical process of the hand, in the other examples it appears to be stiff and straight, but whether the curvature was accidental or the apparent straightness due only to an optical effect I am uncertain.

Second Gnathopods rather longer than the first. The side-plates small, wider than deep. The first joint as long as in the first gnathopods, but much less expanded, the front margin convex, the hinder a little sinuous; the second joint slightly longer than broad; the third joint longer than the second, armed as in the first gnathopods, but rather oblong than triangular; the wrist longer and broader than the third joint, broader but shorter than the hand, the front margin ciliated, nearly straight, the hind margin a little ciliated below, with three apical feathered spines; the hand two and a half times as long as broad, ciliated on both margins, carrying a feathered spine at the hinder apex; the finger as long as the hand, slender, a little curved, feathered with cilia except near the base, apically produced into two acute processes, one longer than the other both finely pectinate, with a slender spine or nail between them, which projects a little beyond the longer.

First Peræopods much stouter than the second gnathopods, but not nearly twice as long. Side-plates rather wide and shallow, a little deeper behind than in front. Branchial vesicles simple, more or less oval, easily detached, all the pairs very similar. The first joint widening distally, the front margin sinuous, the hinder convex; the second joint little longer than broad; the third joint widening distally, a little decurrent at the front apex; the fourth joint a little narrower than the third, with the muscles placed near the front, to make room for a glandular cavity, which exhibits the system of branched cuticular canals, leading from the gland-cells to the exits, as figured by Claus for *Phronima* (Phronimiden, Taf. iii. fig. 16); fifth joint as long as, or a little longer than, the third or fourth, a little bent, width almost uniform, the hind margin sinuous, with two minute cilia, and a tooth-like apex, within which there is a very small spine; the finger curved, very acute, more than half the length of the fifth joint.

Second Peræopods a little larger than the first, similar.

Third Peræopods.—Side-plates wider than deep, bilobed. First joint dilated, the lower half more than the upper, longer than broad; the second and following joints very similar to those of the preceding peræopods, but all on a somewhat larger scale, the third, fourth, and fifth joints subequal in length, the fourth with the front margin finely pectinate, the fifth with that margin rather more strongly and more decurrently pectinate.

Fourth Peræopods not very much shorter than the preceding pair; the first joint larger than in the preceding pair, its greatest width near the base, diminishing downwards; the following joints narrower than in any of the preceding peræopods, the fourth joint shorter than the third, with the glandular space either absent or much reduced, the

front margin finely pectinate; the fifth joint rather longer than the third, its front margin pectinate.

Fifth Peræopods.—The side-plates a little deeper behind than in front, with a generally semicircular appearance. The first joint widely expanded, rather longer than broad, the front margin sinuous, bowed out in the middle, the hind margin very convex and regular, the remaining joints small, together scarcely as long as the first, the second not longer than broad, the third and fourth nearly equal, two or three times as long as broad, the fifth longer than either; the finger not half the length of the fifth joint, broad at the base, the upturned tip very acute.

Pleopods.—The peduncles broad and thick; the cleft spine on the first joint of the inner ramus having the serrate arm shorter than that with the subapical dilatation; the first joint of the outer ramus bearing a prominent, apically narrow, interlocking process; the joints of the rami from nine to ten in number.

Uropods.—Peduncles of the first pair rather longer than the inner ramus, pectinate round the outer apex; the inner ramus larger than the outer, its outer margin pectinate nearly to the apex, and the inner for a short space at a little distance from the apex; the outer ramus pectinate on both margins, more strongly on the inner; peduncles of the second pair not reaching so far as those of the first, not as long as the inner ramus; inner ramus longer and much broader than the outer, the outer margin pectinate and the inner near the apex, the outer ramus with only the inner margin pectinate; these rami respectively not reaching so far as those of the first pair; peduncles of the third pair a little longer than broad, widening distally so that their inner apices touch or overlap, shorter than the nearly equal rami; the inner ramus broader than the outer, rather strongly pectinate for a short space on the inner margin near the apex, and less strongly on the outer margin for a longer space, the pectination on the margins generally becoming very minute at the upper part; the outer ramus pectinate along almost all the inner margin but on that only; the peduncles and rami respectively of this pair reach beyond those of the other pairs.

Telson subequal in length to the peduncles of the third uropods, longer than broad, narrowing from near the base to an acute apex, with the sides very slightly convex, the tip just showing beyond the peduncles of the third uropods.

Length.—The specimen, in the bent position figured, measured one-fifth of an inch; the figures *a.i.A.*, *l.s.A.*, *m.A.*, *mxp.A.*, *gn*^{1}*A.*, were taken from parts of this specimen; the remaining figures from another specimen as nearly as possible similar.

Locality.—April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. Eight specimens, apparently all males.

Remarks.—The specific name is given in honour of Boeck, the founder of the genus

Tryphana. From *Tryphana nordenskiöldi*, Bovallius, the present species differs in having the second gnathopods decidedly longer than half the first peræopods, the first peræopods not as long as the fourth, the third peræopods longer than the peræon, the telson not longer than, though projecting a very little beyond, the peduncles of the third uropods. Bovallius' species was taken "off the Færø Islands at lat. 65° N.," at a great distance therefore further north than the locality of the present species. Bovallius in one description of *Tryphana nordenskiöldi* says,—"Dactylus of first pair of pereiopoda [*Gnathopods*] pedunculated," an expression which does not seem applicable to the Challenger species, but in the absence of a figure I do not clearly understand it. The type-species, *Tryphana malmii*, Boeck, was taken by Boeck in the Hardangerfjord, and by Sars somewhat further north at Folgerøen.

Genus *Brachyscelus*, Spence Bate, 1861.

1852. *Daira* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 981, 993.
1852. *Dairilia* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1519, 1596, 1604 (the spelling *Dairinia*, p. 1442, probably a misprint).
1861. *Brachyscelus*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. viii. p. 7.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 333.
1862. *Thamyris*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 335.
1871. *Schnehagenia*, Claus, Unters. über den Bau und die Verwandschaft der Hyperiden, Nachrichten K. Gött. Soc., p. 157.
1878. *Thamyris*, Claus, Zool. Anzeiger, Jahrg. i. p. 270.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, p. 32.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 426.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 485.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk Vetensk.-Akad. Handl., Bd. 11, No. 16. p. 30.
1887. „ Bovallius, Arctic and Antarctic Hyperids, Vega-Exped., Bd. iv. p. 574.
1887. „ Claus, Die Platysceliden, pp. 55, 56.

Dana's *Dairilia* being rejected for its inherent obscurity, the name next in order is *Brachyscelus*, Spence Bate, which was probably set aside by Claus as coming too close to the already occupied *Brachyscelis*, but, though it is no doubt a disadvantage to have names so nearly alike, it is still more confusing to make the law of priority subject to individual judgment upon the more or less similarity that one name may bear to another. For the original definition of *Brachyscelus*, see Note on Spence Bate, 1861 (p. 327); for that of *Thamyris*, Note on the same author, 1862 (p. 337). For a short definition by Claus of the same genus, see Note on Claus, 1879 (p. 492). It is more fully defined by Claus as follows:—

"Body with thick, anteriorly rounded head, moderately broad peræon, and narrower elongate pleon. Hinder antennæ in the male with long shaft and short terminal joint,

in the female wanting. Limbs of the peræon short, with wing-like projecting side-plates. *Both pairs of gnathopods with complex denticulate chelæ* and very thick wrists dilated helmet-like. Large gland-cells in the first joint of the first three peræopods. The laminar first joints of the third and fourth peræopods comparatively small, triangular, and pretty much alike. Fifth peræopods similarly formed, but much feebler. Peduncles in the first and second pairs of uropods elongate, almost equal in length. Rami of the third pair of uropods broadly lanceolate (flossenförmig verbreitert)."

It may be observed that the epithet triangular does not very well suit the first joint of the third peræopods. Bovallius in defining the genus states that the third peræopods are not longer than the fourth, and that the peduncles of the first pair of uropods are longer than the rami, but the characters are not applicable to all the species.

Brachyscelus crusculum, Spence Bate (Pl. CXCV.). Specimen A.

1861. *Brachyscelus crusculum*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. viii. p. 7, pl. ii. figs. 1, 2.
1862. „ „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 333, pl. liii. figs. 2, 3.
1887. *Thamyris crusculum*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11. No. 16, p. 31.

The postero-lateral angles of the first two pleon-segments produced into small acute points, simply squared in the third segment. The heart shows several constrictions, the lateral orifices in the first two divisions appearing to be within the third and fourth segments of the peræon.

Eyes large, covering the sides of the head except a small strip at the back.

Upper Antennæ.—Terminal joint of the peduncle almost evanescent, first of the flagellum long, the brush on the convex side not developed in the specimen but in preparation, the opposite margin carrying many filaments almost from the base to the narrowly produced apex, this apex no doubt representing the second joint still in coalescence with the first; the following joint minute, abruptly narrower than the apex of the first; the termination broken.

Lower Antennæ.—The basal joint with the gland-cone not completely coalesced with the wall of the head; the following (third) joint of the peduncle long, curved, distally widened, the fourth joint similar, a little longer, the fifth narrower, not longer than the third; the first joint of the flagellum rather shorter than the last of the peduncle, much curved, and in our specimen obstinately doubled upon itself; the terminal joint scarcely half as long as the preceding. The joints were almost entirely smooth, though with indications, especially on the last, that the usual fringe of short filaments would be developed later.

Mandibles.—The trunk very small, especially narrow where the palp is attached,

with a triangular front, the lower side of which forms the striated cutting edge; the secondary plate on the left mandible nearly as large as the principal plate; the tooth-like process on the inner surface to the rear of the cutting edge is small and narrow; the palp set far back has very much of a four-jointed appearance, the small eminence on which it is placed looking like a distinct joint; of the three regular joints the first is longer and much broader than either of the others, with one margin straight, the other convex; the second joint is similar in shape; the third is a good deal longer than the second, slender, distally tapering, much curved.

First Maxillæ.—These appear to be short, thin in texture, with smooth edges and rounded apex, not nearly reaching the distal end of the inner plate of the maxillipeds.

Second Maxillæ.—Apparently represented by a pair of smooth oval plates partially overlapping one another, thin in texture, much shorter than those of the first maxillæ.

Maxillipeds.—The inner plate is much longer than broad, longitudinally ridged on the inner surface for some distance from the base upwards; the distal margin almost straight, having at the centre a pair of little embedded teeth; the outer plates very much larger than the inner, very broad at the base, the outer edge folding a little inwards, the inner margin sinuous, almost smooth or microscopically pectinate; there are some minute setules along the outer surface, and a strong longitudinal ridge rises from the base at some distance from the inner margin on the inner surface.

First Gnathopods.—The side-plates strongly produced forwards, with rounded front apex, and the top of the front margin folded. The first joint not strongly twisted, but sinuous, deeply channelled in front both at the proximal and distal ends, and behind forming a small elbow just below the side-plate; the much produced front apex of the large wrist is finely pectinate, its chela-forming process has seven teeth on the front and eight on the hind margin besides the apical tooth and many little denticles; there are nine teeth on the distal half of the hind margin of the hand; finger less than half the length of the hand. One of the limbs in this specimen is only three-jointed, the third joint being abnormal, oval.

Second Gnathopods.—Branchial vesicles large, both in this and the following pairs having many lateral pockets. The first joint almost straight, channelled in front, the front margin of the outer surface convex below; the front of the wrist with the apex not produced downwards, though standing out from the hand; the chela-forming process more produced than in the first pair, with nine teeth on the front and four on the hind margin, besides the apical tooth; the hind margin pectinate almost from the base to the four teeth just mentioned; the hind margin of the hand has nine teeth; finger much less than half the length of the hand.

First Peræopods.—Side-plates much wider below than above. First joint bent near the base; third joint a little wider but scarcely longer than the fourth, the hind margin faintly denticulate; the fourth similar to the third, more strongly denticulate, the fifth

longer than the third or fourth, with the hind margin more strongly denticulate; finger small.

Second Peræopods similar to the first, but third, fourth, and fifth joints longer, especially the fifth, and the denticulation of the third and fourth joints less apparent.

Third Peræopods.—Side-plates with the front lobe almost acute in front, the hinder squared; a squarely produced process on the inner surface has the lower hinder apex narrowly produced backwards. Branchial vesicles greatly widened above the centre. The first joint oval, not so long as the next four joints together, the front margin with ten or eleven distant shallow serration teeth, distally somewhat squarely produced beyond the convex hinder margin; the third joint longer and broader than the fourth, with little teeth along much of the front margin; the fourth also pectinate distally; the fifth joint longer than the third, almost smooth; the finger small.

Fourth Peræopods.—The first joint longer and broader than in the preceding pair, much wider above than below, very squarely produced in front below the hind margin, the distal margin finely but not uniformly pectinate, the front margin serrate with fifteen little spinule-bearing teeth, the joint longer than all the other joints together; the third joint decidedly longer than the fourth, and the fifth than the third, all three conspicuously denticulate with unequal teeth, those on the third joint the largest, standing straight out, those on the fifth joint somewhat decurrent; the finger small, not much curved, pectinate along much of the inner margin, with a larger denticle in the midst of the pectination.

Fifth Peræopods.—Side-plates nearly square. The first joint much dilated, much smaller than that of the preceding pair, much longer than the rest of the joints together, the united length of which about equals its breadth; the third joint is much wider than the fourth, longer than the fourth and fifth together, faintly pectinate on part of the front margin; the fourth joint is a little longer and much broader than the fifth, with the front margin pectinate; the little fifth joint is slightly produced in front; the minute finger has a triangular front division and a slender curved hinder one.

Pleopods.—Peduncles stout; in the cleft spine the arm with the subapical dilatation is the longer; the joints of the broad rami thirteen or fourteen in number; the interlocking process on the first joint of the outer ramus not very elongate, with sinuous lower margin.

Uropods.—Peduncle of the first pair prismatic, a little longer than the outer ramus, having a small pectinate distal lobe; the rami are also prismatic the outer with the outer margins smooth the inner closely denticulate; the longer inner ramus has the inner margin closely and the outer loosely denticulate; the peduncles of the second pair a little shorter than those of the first, which they resemble, but with the inner apex more produced, their length subequal to that of the outer ramus; the rami broadly lanceolate, the outer with the lower part of the inner margin denticulate; the inner ramus broader

and longer than the outer, not quite so long as the inner of the first pair, denticulate on the lower part of the outer, and more loosely on the lower half of the inner margin; peduncles of the third pair wide apart, much shorter than the rami; the rami widening greatly from the base, so as to be broadest below the centre, thence narrowing to an acute apex, the outer ramus rather the shorter, with smooth outer margin, and the lower part of the inner denticulate, the inner ramus much the broader, denticulate on both margins below the widest part.

Telson reaching a little beyond the rami, subequal in length to the coalesced fifth and sixth segments, longer than broad, the breadth nearly three-quarters of the length, in outline forming an elongated inverted arch, the apex almost acute.

Length, in the position figured, two-fifths of an inch.

Locality.—April 3, 1875; North Pacific, lat. 24° 49′ N., long. 138° 34′ E.; surface temperature, 71°·5. One specimen, male.

Remark.—The specimen described by Spence Bate from some unknown locality was three-quarters of an inch in length, therefore much longer than the Challenger specimens.

Brachyscelus crusculum, Spence Bate (Pl. CXCVI.). Specimen B.

This specimen was in the first instance figured and described as a distinct species, but I think it may be regarded as the adult male form of *Brachyscelus crusculum*. The head is not smoothly rounded as in specimen A; the angles of the first three pleon-segments are similar.

Upper Antennæ.—First joint of the peduncle cylindrical, longer than broad, the following joint or joints very small, imperfectly developed; the first joint of the flagellum large, and with a large brush of filaments on the convex side, the straight upper margin having a series of broader filaments, the apex narrow, not produced; the next joint narrow, a little bent, having five groups of filaments; the third joint shorter and abruptly narrower, with filaments at the apex.

Lower Antennæ.—The third joint of the peduncle elongate, the basal half curved, the distal end dilated, fringed like the remaining joints with numerous short filaments, the fourth joint decidedly longer than the third, straight, the fifth joint a little longer than the fourth, the first of the flagellum longer than the third, but shorter than the fourth or fifth joint of the peduncle, the second joint about a quarter the length of the first.

Mandibles.—Trunk elongate, narrow, the point of the distal triangle forming a blunt tooth at the top of the cutting edge; the first joint of the palp much longer than the third, which is itself longer than the second.

Above the figure of the maxillipeds, in the middle of the Plate, the head is figured

from below, showing the antennæ and mouth organs *in situ;* the appearance of these in a lateral view is given in the adjacent figure on the right; below the figure *mxp.* is a figure of the dilated stomach.

First Gnathopods.—Side-plates sharply produced forwards. First joint curiously twisted, narrow at the base, then greatly widened by the backward bend of the hind margin, this margin then crossing the surface to the lower apex of the sinuous front margin, the joint at the elbow being much wider than above or below it; as in the preceding specimen the second and third joints have some small spines on the hind margin; in this genus, as in many genera of the Hyperina, the third joint, having assumed the form of a small wrist, is an exception to Spence Bate's rule, that in the gnathopods the third joint always *underrides* the fourth; the much dilated wrist has the broadly produced front apex scarcely perceptibly pectinate; the chela-forming process has on the front or inner margin five teeth besides denticles, and on the hinder or outer margin eight teeth and a few denticles; the apical tooth is additional; the hind margin of the hand has nine teeth.

Second Gnathopods.—The first joint a little curved, the lower part of the front channelled; the front apex of the wrist not produced downwards, nor nearly so large as in the first pair, finely pectinate, and carrying three or four little teeth, the chela-process with seven teeth on the front margin, one of them being an accessory denticle to the apical tooth; the hind margin is pectinate for some distance from the base, and then divided into four or five teeth; the hind margin of the hand has eight teeth.

Third Peræopods with the first joint a long oval, not quite twice as long as broad.

Fourth Peræopods.—The first joint not at all longer than the first joint of the preceding pair, but with the upper part very much wider, the lower margin in front of the second joint scarcely or not produced below that joint; the third, fourth, and fifth joints with the front margin closely pectinate with large and small teeth; the finger having some small decurrent teeth along much of the inner margin.

Fifth Peræopods.—The first joint much longer than wide, widest at the centre, the width there exceeding the length of all the other joints together, those joints being nearly as in specimen A.

Pleopods.—The rami with fourteen or fifteen joints.

Uropods very similar to those of the species just named.

Telson as long as the third uropods, its breadth rather more than two-thirds of its length, more rounded apically than in specimen A.

Length, in the bent position figured, two-fifths of an inch.

Locality.—July 1875, North Pacific, between Japan and Honolulu; lat. 35° N.; surface. Male specimen.

Remarks.—A female specimen from the same locality has the first joint of the first

gnathopods straight, the upper antennæ like those figured by Claus for the female of *Thamyris globiceps*, and the telson with acute-angled though not outdrawn apex.

A species of this genus from "Ocean Beach, Dunedin," New Zealand, of which Mr. G. M. Thomson very kindly sent me detailed description and figures, is in the closest relationship to the specimen B here described, but with the head less rounded and the telson "acutely triangular." The differences between specimen A and specimen B consist chiefly in the shape of the head, the form of the first joint in the first gnathopods, and the more or less rounding of the apex of the telson. The first and third of these may, I think, be attributed to individual variation, the remaining and the most striking difference I have, after much hesitation, assumed to be a character of age and sex. The specimens with the strongly twisted joint have the antennæ of the adult male, those in which it is slightly twisted have the lower antennæ incompletely developed, and female specimens have only a suggestion of the twisted first joint. Spence Bate's figure of *Brachyscelus crusculum* ♀, Claus' figures of the gnathopods of *Thamyris mediterranea*, young male, and *Thamyris rapax* ♀, as well as Mr. Thomson's figure of the male specimen from New Zealand, all lend support to the supposition that in this genus the strongly twisted arm of the first gnathopod is a character only of the adult male.

Brachyscelus inæquipes (Dana ?).

1852. *Daira inæquipes*, Dana, U.S. Explor. Exped., vol. xiii. pt. ii. p. 993, pl. lxviii. figs. 5 *a–c*.
1862. *Dairinia inæquipes*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 310, pl. l. fig. 6.
1887. *Thamyris inæquipes*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 31.

A specimen with large head and great eye-pigment, a single pair of slender straight antennæ, in which the third joint is longer than the second or fourth, the mandibles without palp, the first joint of the first gnathopods not twisted, and the front process of the wrist not much produced, the lower margin of the first joint in the fourth peræopods produced below the second joint, the first joint of the fifth peræopods not so dilated as in the other two species here described, the telson narrower than in those species, apically almost acute.

Of the *Mandibles* one has a secondary plate with finely denticulate edge, resembling the principal plate but smaller, while the other has a spine-like process like that described for *Brachyscelus crusculum*; in each mandible the principal cutting edge has a minute tooth at the lower end and a larger obtuse one at the upper; the upper lip is broader than deep, embracing the distal triangular ends of the two mandibles. The mouth organs probably in all essential respects agree with those of the other species.

Locality.—February 6–7, 1875, south of Mindanao, Celebes Sea; lat. 6° 20′ N.,

long. 123° 18′ E.; surface, at night; surface temperature, 81°·7. The specimen female or young.

Remarks.—Dana's *Dairilia inæquipes*, two lines long, was taken "off south end of Mindoro." The specific name probably refers to the inequality in length between the third and fourth peræopods. In the third peræopods the second joint reaches below the first, and the first is not nearly as long as the following five joints; in the fourth pair the second joint does not reach below the first, and the first joint is scarcely if at all longer than the following five; it is however somewhat longer than the first joint of the preceding pair.

Brachyscelus latipes, ♀, n. sp. (Pl. CXCVII., B.).

Head large, deep and rounded, the triangular cavity which contains the antennæ and mouth-organs being entirely below, not at all in front, the hind margin sinuous laterally; the peræon narrowing a little backwards, the first two segments very short; the third segment of the pleon the longest. The integument both of head and body very firm, with conspicuous scale markings.

Upper Antennæ.—The first joint the thickest; the second about half the length of the first, the two together forming a curve; the third joint as long as the first or a little longer, carrying groups of filaments on the upper margin; the fourth and fifth joints together not so long as the third, the fifth very slender.

Lower Antennæ represented in the female only by the prominent gland-cone.

Epistome domed; the *Upper Lip* small, transversely oval.

Mandibles.—The trunk broad, especially near the front; the cutting edge broad, with a prominent tooth at the top, the border slightly convex, finely striated, without any tooth at the lower corner, on the right mandible there is a little upturned spine-like process, adjacent to the hind margin of the principal plate near the centre.

Maxillipeds.—The distal border of the inner plate flat, wider than the base, having two little central embedded spinules; the outer plates with their inner margins little dehiscent, minutely pectinate, the surfaces carrying some small spinules.

First Gnathopods.—The first joint scarcely at all bent, the lower part channelled in front; the second joint with a strong brush of spines along the hind margin; the third joint not longer than broad, also with several spines about the hind margin, but not closely grouped as in the second joint; the wrist very much wider than the third joint, wider than long, the front margin convex, smooth, the hind margin pectinate and divided into five teeth, to which succeeds the apical tooth, the broad distal margin on the other side of it being also pectinate and divided into four teeth; the hand shorter than either the length or breadth of the wrist, with front margin smoothly

convex, hind margin pectinate and divided into six teeth, successively larger to the apical; finger about half the length of the hand, with hind margin slightly pectinate.

Second Gnathopods very similar to the first, but the first joint more channelled, second and third joints with few spines, the wrist much more strongly produced, with three teeth on the hind margin above the apical tooth, and four on the front or inner margin of the process; the hand not reaching beyond the apex of the wrist, its hind margin pectinate and divided into four teeth, successively larger to the apical; the finger less than half the length of the hand, curved, the inner margin pectinate.

First Peræopods.—Side-plates broader than deep, produced both forwards and backwards beyond the base. The first joint long and slender, bent at the upper part; the second joint longer than broad; the third and fourth joints subequal in length, almost smooth; the fifth abruptly narrower but a little longer than the fourth, the hind margin a little spinulous; the finger curved, smooth, little more than a quarter the length of the fifth joint.

Second Peræopods like the first, but with the third, fourth, and fifth joints conspicuously longer.

Third Peræopods.—Side-plates with the front lobe narrowly produced, the hinder broad, and having a sort of squared process on the inner side with the lower hinder angle slightly produced downwards. The first joint as long as the four following together, distinguished by its great breadth, the maximum being a little above the centre, the hind margin very convex, the front margin, the distal margin behind the second joint, and the whole surface of the joint also convex; the third joint longer and broader than the fourth, which is in turn broader than the fifth; the fifth slender, slightly curved, rather longer than the third; the armature of all these joints very inconspicuous, the sinuous distal margins of the fourth joint finely pectinate on the inner and outer sides of the limb; the finger not a fourth of the length of the preceding joint.

Fourth Peræopods.—The side-plates with the front lobe not produced forwards, much shallower than the hind lobe. The first joint very little longer than in the preceding pair and not so broad, the front margin nearly straight, with some slight serration and a few small spinules, the lower angle rounded and the distal margin in front of and below the second joint broad and almost flat, while the convex hind margin does not reach to the end of the second joint; across the top of the second joint there is an inner surface margin, distally straight, with a small rounded lobe behind; the third joint is longer and broader than the fourth, not apically produced, strongly pectinate along the front margin and front part of the distal margin; the fourth joint is armed in like manner, and with pectination also at the apex of the hind margin; the fifth joint straight, slightly tapering, narrower than the fourth, almost as long as the third,

pectinate with closer, finer, and more decurrent teeth along the front margin, the apex also pectinate and slightly produced behind; the finger nearly straight, pectinate on the inner margin, rather more than a quarter of the length of the fifth joint.

Fifth Peræopods.—First joint pear-shaped, longer than the other joints together; second joint not longer than broad, third straight, more than twice as long as the second; fourth shorter than the third, with convex front margin; fifth shorter than the fourth, with hind margin convex, and the front straight; the exceedingly minute finger forms a blunt triangle in front, with a slender curved process behind it, extending from near its base beyond the apex.

Pleopods.—Peduncles broad, not very long; coupling spines broad-headed, with some lateral teeth below the apical; the cleft spine with the longer arm very slightly dilated, placed at the broad top of the first joint of the inner ramus, and followed by six or seven plumose setæ along the inner margin of the same joint; the first joint of the outer ramus has eight or nine plumose setæ on the outer margin; joints of the inner ramus eleven or twelve, of the outer twelve or thirteen.

Uropods.—Peduncles of the first pair shorter than the rami, the distal margin pectinate on the under surface; the rami elongate, three-sided, reaching beyond the other pairs, the outer rather shorter than the inner, pectinate along two edges, the inner margin near the base smooth, convex, the joint then narrowing rather abruptly, the inner ramus also pectinate on two edges; peduncles of the second pair longer than the outer, shorter than the inner, ramus; the outer ramus almost smooth on the outer margin, pectinate on the inner, much shorter and narrower than the inner ramus, which is pectinate on both margins, but smooth on the upper part of the inner; peduncles of the third pair not longer than the distal breadth; the outer ramus shorter and much narrower than the inner, pectinate on both margins of the narrow lower part; the inner ramus broad till near the apex, then almost abruptly narrowed, pectinate on the lower part of each margin.

Telson reaching about to the apex of the inner ramus of the third uropods, rather longer than broad, not quite so long as the preceding composite segment, the end broadly rounded.

Length, with pleon flexed, under three-tenths of an inch.

Locality.—October 1875, South Pacific, surface. One specimen, female, with numerous eggs.

Remark.—The specific name refers to the great size of the first joint in the third peræopods, which seems to distinguish this species from all others as yet described in this genus.

Brachyscelus bovallii, n. sp. (Pl. CXCVII., A.).

This species is closely allied to *Brachyscelus rapax* (Claus), but smaller and with the head rather more rounded. Claus gives a figure of the animal from the ventral side, showing the long broad groove which separates the eyes on the under side of the head. As this is a very unusual aspect to be figured, because of the difficulty of arranging a specimen suitably for the purpose, it may be mentioned that the specimen from which the new species is described attracted attention by spontaneously assuming the requisite position. Though, however, in this aspect the Challenger specimen closely resembles Claus' species, it is separated from it by various points of detail.

Upper Antennæ.—Peduncle short; first joint of flagellum long, not strongly curved, the apex little produced, the long convex under side with the usual brush of filaments, the upper margin not very short, carrying a dozen pairs of filaments; the small second joint twice as long as broad, with filaments at four or five points, the third joint linear.

Lower Antennæ.—Third (first free) joint of peduncle three-quarters the length of the next joint, proximally curved, distally widened, fringed like the following joints with short filaments; the fourth joint straight, distally widened, the next joint broken and the others missing.

First Gnathopods.—The lower front corner of the side-plates produced, rounded. The first joint twisted, the elbow behind a little more prominent than the distal convexity of the front margin; the second joint with two spines at the apex of the hind margin; the third joint small, very little longer than the second, but distally much wider, with two spines at the hinder apex and one spine on the margin above it; the wrist of the usual pattern, but with scarcely any pectination, while the teeth are long and slender, five in number above the apical tooth on each margin of the process; the hand has five teeth on the hind margin, graduated in size, the apical being the longest and reaching nearly halfway along the finger, close to which it lies; the finger curved, more than half the length of the hand. Claus' figure of the first gnathopod of "*Thamyris rapax*" shows three teeth on the hand, and on the wrist three teeth on one side and four on the other side of the apical tooth.

Second Gnathopods.—The first joint almost straight and parallel-sided; the wrist differing little from that of the first gnathopods, except as usual in not having the prominent rounded apex of the front margin; the upper part of the hind margin is straight and smooth; above the apical tooth there are four teeth on the hind margin of the process, and in one limb three, in the other five, on the front, with more serration than in the first gnathopods; the hand has five teeth on the hind margin besides some serration; the finger scarcely so long as in the first pair.

First and Second Peræopods very slender, smooth, except for the pectination of

the hind margin of the fifth joint and some extremely minute pectination of the distal margin of the fourth.

Third Peræopods.—Inner process of the side-plates with the lower corner produced backwards, scarcely acute. The first joint shorter than the remaining joints together, moderately expanded, narrowing downwards, the front margin straight except at the two extremities, not apically produced, the hinder margin convex; the second joint reaching below the first; the third very little longer than the fourth, the fifth longer than the third, the finger not a third the length of the fifth, all these joints smooth.

Fourth Peræopods.—The inner process of the side-plates with a very irregular lower margin. The first joint not longer than the remaining joints together, similar in shape to the first joint of the third peræopods, but rather longer and much broader, the apex of the front margin also being produced below that of the hinder margin as far as the apex of the short second joint; the third joint considerably longer than the fourth, pectinate except near the base along the front margin, and much more finely on the distal margin; the fourth joint similarly pectinate, but more strongly and irregularly on the distal margin; the fifth joint longer than the fourth, shorter than the third, pectinate on the front and distal margins; the finger about a third of the length of the fifth joint.

Fifth Peræopods.—First joint pear-shaped, not very widely expanded, the front margin much straighter than the hinder one; the remaining joints together more than two-thirds of the length of the first; the second joint as broad as its length; the third not very much longer or broader than the fourth; the fourth broader but not very much longer than the fifth; all of the joints smooth, the fifth produced in front into a small triangular process, round which the small slender finger curves, a small setule projecting between. In all the species there is such a setule, and in some it is a little doubtful whether the finger is really folded or only curved round a projecting apex of the fifth joint.

Pleopods.—The rami rather short, with nine joints to the inner, and ten to the outer ramus.

Uropods.—Peduncles of the first pair reaching rather beyond the base of the telson, equal in length to the inner ramus, the distal margin of the under surface pectinate; the rami carinate beneath, the outer much narrower and a good deal shorter than the inner, pectinate on both margins except at the widened part close to the base; the inner ramus reaching beyond the telson, pectinate on the outer margin, a little serrate on the lower part of the inner; peduncles of the second pair shorter than the inner ramus, the rami damaged, seemingly very similar to those of the first pair but a little smaller and not carinate; peduncles of the third pair not longer than the distal breadth, the outer ramus shorter and narrower than the inner, pectinate on the lower part of each margin; the inner ramus reaching beyond the telson, the outer margin pectinate on the lower half, the inner margin almost straight and smooth, the apex broad but worn, so that the true apex may be acute.

Telson longer than broad, with gently convex sides and a broadly rounded apex, so that it has nothing of the triangular appearance presented by many other species of the genus.

Length, one-fifth of an inch.

Locality.—October 1875, South Pacific; surface. One specimen, male.

Remarks.—The specific name is given out of respect to Professor Bovallius. *Brachyscelus rapax* (Claus), from the Cape of Good Hope, is said to have the third joint of the fourth peræopods not pectinate, and the first joint of the fifth peræopods equal in length to the remaining joints together; the peduncles of the first pair of uropods are described as little longer than the rami, but figured a little shorter; the length of the specimen described is given as about two-fifths of an inch, whereas the Challenger specimen, also an adult male, is only one-fifth of an inch long. *Brachyscelus latipes*, above described, which agrees with the present species in regard to the telson and more or less in regard to the uropods, is very different in the third and fourth peræopods. The present species is in some respects a connecting link between the genera *Brachyscelus* and *Thamneus*.

Brachyscelus acuticaudatus, n. sp. (Pl. CXCVII., C.).

Back of peræon rounded, a little compressed laterally, side-plates small and shallow; first three pleon-segments with the sides angled.

Eyes occupying almost all the surface of the head, leaving free a small strip at the base; the upper division of the eye much smaller than the lower front one, closely contiguous to it; dorsally the head has a small space free where the four ocular divisions approach one another.

Upper Antennæ (of the female) forming a single bend, the first joint of the peduncle nearly three times as long as the second joint; the first of the flagellum as long as the first of the peduncle, with five groups of filaments on the slightly narrow distal half; the second joint narrow, not half the length of the first; the following joint broken off.

First Gnathopods.—The first joint straight, channelled in front; the short second joint with a strong brush of spines on the hinder distal margin; the wrist with seven teeth on either side above the tooth of the apical process; the hand with eight teeth on the hinder margin and one on the distal margin.

Second Gnathopods.—The wrist process with six teeth on the hind margin and nine on the front or inner margin; the hand with six teeth on the hinder and one on the distal margin.

First and Second Peræopods.—Only the fifth joint pectinate.

Third Peræopods.—Side-plates with the inner process produced acutely backwards. The first joint of the limb long oval, narrowest distally, the slightly serrate front margin being a little concave near the apex, which is produced a little below that of the hind margin.

Fourth Peræopods.—The first joint longer and much broader than that of the third peræopods, the greatest breadth above the middle, below which the joint narrows rapidly; the front margin nearly straight, shallowly serrate and carrying little spines, the squared apical lobe reaching considerably below the second joint; the hinder margin, of which the upper part only is strongly convex, has a rounded apex not reaching to the end of the second joint; the third joint is not longer than the fifth, each of them longer than the fourth, all the three being pectinate in the usual way along the front margin and round the apex.

Fifth Peræopods.—The side-plates with little semicircular marks, the lower hind corner a little outdrawn. The limb nearly as in *Brachyscelus crusculum.*

Pleopods.—The dilated arm of the cleft spine the longer; the rami long, joints of the inner ramus thirteen or fourteen in number, of the outer fourteen or fifteen.

Uropods.—Peduncles of the first pair about equal in length to the inner ramus, reaching to the base of the telson; the rami not very broad, carinate beneath, the inner a little longer than the outer, as long as the telson, closely pectinate on the outer margin, loosely serrate on the inner; the peduncles of the second pair reaching nearly as far as those of the first pair, the rami damaged; peduncles of the third pair short, the outer ramus slightly carinate, its outer margin smooth and almost straight, the inner margin very convex, with the lower part pectinate; the inner ramus missing.

Telson triangular, much longer than the breadth at the base, constricted a little near the acute apex, the sides having very little convexity.

Length, about two-fifths of an inch.

Locality.—August or September 1875, Pacific Ocean; surface. One specimen, female.

Remarks.—The specific name refers to the sharply narrowed tip of the telson, which is a distinguishing feature of the species; the shape of the first joint of the fourth peræopods is another well-marked character.

Brachyscelus mediterranea (Claus).

1887. *Thamyris mediterranea*, Claus, Die Platysceliden, p. 60, Taf. xvi. figs. 11–18.

The segments a little imbricated.

First Gnathopods.—The first joint almost straight, the wrist with five teeth on the hind margin, four on the inner margin of the process, and the apical tooth, the hand not reaching beyond the apical tooth of the wrist, having six teeth on the hind margin.

Second Gnathopods differing little from the first; the wrist with three teeth on the hind margin, five teeth on the inner margin of the process, and the apical tooth; the hand not quite reaching the tip of the wrist's apical tooth, having six teeth on its inner margin. The dentate margins in both gnathopods have as usual some pectination in addition to the dentation.

Fifth Peræopods.—The terminal joints as figured by Claus, but not bearing the same proportion to the first joint, which is much longer than all of them together.

Pleopods.—Coupling spines very small, without any but the apical teeth; joints of the rami nine to ten in number.

Uropods.—The inner ramus of the third pair is rather widened at a little distance from the acute apex, in this respect not entirely agreeing with Claus' figure.

Telson longer than broad, triangular, somewhat more acute at the apex than that figured by Claus.

Length, a quarter of an inch.

Locality.—April 26, 1876, off St Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface; surface temperature, 73°·2. One specimen.

Remark.—The differences are too slight to admit of any reasonable doubt that this is the species described by Claus from the neighbourhood of Naples.

The following table shows the distribution of the genus *Brachyscelus* as illustrated by the Challenger specimens:—

1. April 26, 1876, off St Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface. One specimen (*Brachyscelus mediterranea*, see p. 1556).

2. Station 351, April 12, 1876; Atlantic, off coast of Africa; lat. 9° 9′ N., long. 16° 41′ W.; surface; surface temperature, 81°·8.

3. Station 103, August 22, 1873; Tropical Atlantic; lat. 2° 52′ N., long. 17° 0′ W.; surface-net, 100 fathoms; surface temperature, 77°.

4. October 5, 1873, South Atlantic; lat. 29° 1′ S., long. 28° 59′ W.; surface, night; surface temperature, 65°·2.

5. Station 319, February 12, 1876; South Atlantic; lat. 41° 54′ S., long. 54° 48′ W.; surface; surface temperature, 59°·5.

6. February 6–7, 1875, south of Mindanao, Celebes Sea; lat. 6° 20′ N., long. 123° 18′ E.; surface at night. (*Brachyscelus inæquipes*, see p. 1549.)

7. April 3, 1875, North Pacific, south of Japan; lat. 24° 49′ N., long. 138° 34′ E.; surface. (*Brachyscelus crusculum*, ♂, see p. 1544.)

8. Station 230, April 5, 1875; North Pacific, south of Japan; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. Young male, lower antennæ not fully developed, first joint of first gnathopods only slightly twisted.

9. July 1875, North Pacific, between Japan and Honolulu; lat. 35° N.; surface. (*Brachyscelus crusculum*, see p. 1547.)

10. August or September 1875, Pacific Ocean; surface. (*Brachyscelus acuticaudatus*, see p. 1555.)

11. October 1875, South Pacific; surface. Two specimens (one *Brachyscelus latipes*, see p. 1550, and one *Brachyscelus bovallii*, see p. 1553).

To complete the account of the distribution so far as at present known, it may be added that *Thamyris antipodes*, Spence Bate, was taken in lat. 58° S., long. 172° W.; *Thamyris rapax*, Claus, at the Cape; *Thamyris globiceps*, Claus, at Zanzibar; *Thamyris mediterranea*, Claus, near Naples; *Thamyris elegans*, Bovallius, in the Atlantic, and Dana's *Dairilia inæquipes*, at the Philippine Islands.

Genus *Thamneus*, Bovallius, 1887.

1852. *Daira(?)* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 981, 992.
1852. *Dairilia* (*pars*), Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1519, 1596, 1604.
1862. *Dairinia* (*pars*), Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 309.
1885. „ (*pars*), Bovallius, Some forgotten Genera of Amphipoda, p. 9.
1887. *Thamneus*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 31.

For the definition of this genus, see Note on Bovallius, 1887 (p. 591). The first described species of the genus appears to be Dana's *Dairilia* (or *Dairinia*) *depressa*, but Dana's generic name may well be allowed to drop, as well for the doubtfulness of the spelling, as for the reason that Dana himself intended to identify it with Milne-Edwards' *Daira*, from which it differs, and included in it three species, of which two have already been assigned to other genera, and the third remains still doubtful. The name *Thamneus* itself comes rather awkwardly near to the earlier *Thamnus*.

Thamneus platyrrhynchus, n. sp. (Pl. CXCVIII.).

A very broad species, and also deep at the middle of the peræon; the head broader than long and considerably broader than deep; the front of the head, though broad from side to side, is very thin vertically, the rostral point not projecting but folded in on the under side between the antennæ; the peræon has its segments a little dimpled on either side; the fourth and fifth segments are the broadest; the first three segments of the pleon, which are scarcely half as broad as these, have their postero-lateral angles slightly rounded. The skin is covered with minute honeycomb markings. The outer margin of the liver-tubes is deeply corrugated as in *Simorhynchotus*.[1]

[1] See Claus, Die Platysceliden, p. 65, Taf. xvii. fig. 18.

Eyes occupying nearly all the surface of the head, except a strip round the hind margin which projects into an angle at the centre. The thin front margin is also unoccupied at the centre.

Upper Antennæ (of the female) small, projecting from the under surface of the head, at some distance from the front. The first joint is about twice as long as the second; the first joint of the flagellum is tapering, longer than the peduncle, fringed with filaments; the second joint is about a third of the length of the first, and much narrower, not even at the base so broad as the distal end of the preceding joint; the terminal joint is almost linear, more than half as long as the preceding.

Upper Antennæ (of the male), fig. *a.s.B.* First joint of the peduncle distally widened, as broad as long, the second joint incompletely developed; first joint of the flagellum large, the strongly convex lower side covered with a thick brush of long filaments; the second joint attached at the upper end of the rounded apex of the first, much wider than the third joint, and as long as the third and fourth together, its upper margin fringed with filaments; the fourth joint shorter and much narrower than the third.

Lower Antennæ wanting in the female; in the male (fig. *a.i.B*) not longer than the upper antennæ; the second joint to some extent free from the wall of the head; the third joint subequal in length to the fourth, its margins smooth; the fourth joint forming an angle with the third and another with the fifth, as if partially adapted for folding, but these three joints are not elongated or linear; the fourth and fifth joints have short filaments along the straight margin; the flagellum consists of a single joint, shorter and narrower than the preceding joint, with short filaments at the blunt apex and at two points of one margin. It may be questioned whether these antennæ are the fully developed form, but the probability is that they are, since they are found in a specimen which has the upper antennæ and the mandibular palp of an adult male.

Epistome deep and broad, helmet-shaped, its lower margin forming a triangle over the upper edges of the trunks of the mandibles, the apex of the triangle occupied by the small *Upper Lip* over the cutting edges of the mandibles.

Mandibles.—The part of the trunk in front of the palp is narrow, the cutting edge narrow, with a small prominence at the upper angle; the palp is placed on a projection of the upper margin, its first joint much broader than the second or third, but not so long as those two together; the second joint shorter than the third; the third joint curved, apically almost acute.

The Maxillæ appear to be smooth-rimmed oval plates, the first pair much larger than the second, and coalesced along the centre except distally, while those of the second pair are free from one another.

Maxillipeds short and broad; the inner plate with convex sides, and two little embedded spinules close together at the centre of the slightly emarginate distal border;

the outer plates not reaching far beyond the inner nor meeting over it, their outer surface very convex, and broad except distally, carrying a few spinules.

First Gnathopods.—Side-plates small, the lower front corner rounded and a little produced forwards. The first joint for most of its length free from the side-plate, rather broader above than below, the front margin bent out a little near the base, and the hinder margin to a slight extent at some distance from the distal end; the second joint short, with some small spines at the apex of the convex hind margin, and on the distal margin of the inner surface; the third joint a little longer, distally widened in front, the hind margin serrate, carrying some small spines; the wrist wider than the length of the hand, the front margin slightly convex, the hind margin somewhat produced, in length nearly equalling the distal width of the joint, cut into minute teeth, among which are three much more prominent than the rest, the apical being the largest and in fact double though very slender; much of the distal margin facing the hind margin of the hand is also denticulate; the hand is oval, the front margin the more convex and scarcely serrate, the hind margin toothed like the wrist, with one prominent double tooth not far from the narrow distal end, which is occupied by the base of the very short, slightly curved, acute finger, the concave margin of which is not quite smooth. A comparison of specimens shows that the denticulation of wrist and hand in both pairs of gnathopods is subject to variation; indeed, it is not absolutely constant between the two limbs of a pair in one and the same specimen.

Second Gnathopods.—Side-plates broader than the preceding pair. Branchial vesicles longer than the first joint and much broader, with accessory lateral vesicles; the marsupial plates much longer and broader than the branchial vesicles. The limb similar to that of the first gnathopods, the first joint longer and rather broader, the wrist a little longer but not broader.

First Peræopods.—Side-plates wider than deep, the lower margin convex, extending beyond the upper margin both before and behind. The branchial vesicles and marsupial plates similar to those of the second gnathopods, but larger. The first joint for most of its length free from the side-plate, the front margin slightly convex, the hinder a little sinuous; the second joint short, with some spinules on the hind margin; the third joint a little longer than the fourth, a little shorter than the fifth, widened distally, with spinules on the front apex and along the hind margin; the fourth joint slightly narrowed distally, having spinules on the convex front and the straight hind margin; the fifth joint a little curved, tapering, the front margin convex, the hinder slightly concave, with some spinules; the finger minute, curved, acute.

Second Peræopods.—The side-plates deeper than the preceding pair. The branchial vesicles, marsupial plates, and joints of the limb scarcely differ from those of the first peræopods, but the third and fourth joints are a little longer.

Third Peræopods.—Side-plates bilobed, much broader than deep, the front lobe rather deeper and much broader than the hind one. Branchial vesicles similar to the preceding pairs, but larger, broader above than below. Marsupial plates scarcely so large as the preceding pair. First joint oval, with the narrower end at the base, the front margin very regularly convex, scarcely serrate, fringed with spinules; the hind margin with the convexity most developed at the lower end, smooth; second joint short, with spinules on the front margin; third joint rather longer than the fourth, scarcely shorter than the fifth, all three resembling the corresponding joints in the two preceding pairs, but slightly exceeding them in length; the finger also is similar.

Fourth Peræopods.—Side-plates less broad than the preceding pair, the front lobe much deeper than the hind one, and with a straight front margin. The branchial vesicles not quite so large as the preceding pair, much widened at the upper hind corner. The limb differing very little from that of the third peræopods, the hind margin of the first joint more regularly convex, the third joint a little longer, the fifth perhaps scarcely so long, and a little widened at the upper part so that its front margin is not concave, the fourth and fifth joints having their front margins minutely pectinate; the finger a little longer and straighter than in the preceding pair.

Fifth Peræopods.—Side-plates not bilobed, very little broader than deep. First joint as broad as in either of the two preceding pairs but not so long, suddenly narrowed distally, the front margin very slightly, the hinder for the most part very strongly, convex; at the distal end the hind margin is concave and channelled; the remaining joints together do not quite equal the length of the first, and but little exceed its breadth; the second joint short, with some spinules in front, the third joint longer than the second, a little shorter than the fourth, which has a convex front margin; the fifth is very little shorter than the fourth, with a convex hind margin, the front concave for the lower two-thirds; the finger, which is scarcely discernible except with a high power, has something of a horse-shoe shape, the lower point projecting forwards a little in advance of the upper.

Pleopods.—The two coupling spines have short slender shafts, the apical dome or cap having its rim cut into several teeth; the cleft spine is attached close to the top of the first joint of the inner ramus, the subapically dilated arm about as long as the other, the dilatation small; below it on the first joint there are four plumose setæ; the first joint of the outer ramus has a tongue-like interlocking process; the joints of this ramus are eleven in number, those of the inner ramus ten.

Uropods.—The peduncles of the first pair reach beyond those of the second; they are a little shorter than the rami; the outer ramus is scarcely so long as the inner; they are both lanceolate, carinate beneath, with finely pectinate margins, and reach beyond the other pairs; the peduncles of the second pair are shorter than the rami, and only

reach to the base of the peduncles of the third pair; the outer ramus is a good deal shorter than the inner, which in its turn is shorter than either ramus of the first pair; the third pair are similar to the second, and all three pairs agree in general structure.

The Telson is oval in shape, with the base truncate, not coalesced with the preceding segment; it reaches about halfway or rather further along the inner rami of the third uropods.

Length.—The specimen of which the lateral view is figured measured, in a straight line from the front of the head to the back of the second pleon-segment, rather more than a fifth of an inch. Fig. *A* was taken from a rather smaller specimen.

Locality.—April 3, 1874, off Cape Howe, Australia; lat. 38° 7′ S., long. 149° 18′ E.; surface, night; surface temperature, 66°·5. Fifteen specimens, of which ten were probably (and some of them certainly) females, the other five being adult or young males.

Remarks.—The specific name is derived from πλατύς, wide, and ῥύγχος, beak, in allusion to the breadth of the head.

This species is very like *Daira* (*?*) *debilis*, Dana, but in that species the joints of the antennæ are described and figured as all short, there is no rostral point on the under side of the head, the branchial vesicle of the second peræopod is figured as shorter than the first joint, the fifth and sixth coalesced pleon-segments are drawn as longer than the fourth, and the telson is represented as coalesced with the preceding segment; the back of the animal is drawn as if strongly imbricated. Dana's specimen, three lines long, was taken in lat. 2° S., long. 175° W. When Dana says that in the second gnathopods the carpus is hardly smaller than the hand, he is no doubt speaking of the third and fourth joints respectively, not of the fourth and fifth, but either way his remark is inapplicable to our species; he figures the wrist of the second gnathopods with the inner or front margin smooth. *Thamneus rostratus*, Bovallius, must also come near to the present species, but that has the "telson very broad, rounded, a little shorter than last pair of uropoda." It ought to be mentioned that among the Challenger specimens three of the female specimens were much bulkier than the rest, and lighter coloured, so that till the details were compared these three were considered specifically distinct from the others.

Genus *Lycæa*, Dana.

1852. *Lycæa*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1009, 1017, 1443.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 338.
1874. „ Marion, Ann. d. Sci. Nat., sér. 6, t. i. p. 13.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, pp. 32, 37.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 426.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 485.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16. p. 32.
1887. „ Claus, Die Platysceliden, pp. 55, 61.
1887. *Amphipronoë*, Giles, On Six new Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. pt. ii. No. 2, p. 220.

For the original definition, see Note on Dana, 1852 (p. 259). For a short definition by Claus, see Note on Claus, 1879 (p. 492). The fuller definition by Claus is to the following effect:—

"Body *Hyperia*-like, with great thick head, in the male elongate, with powerful pleon, in the female thick and compact. Anterior antennæ concealed in a deep frontal cavity, in the male with a three-jointed flagellum and thick, elongate peduncle, in the female five-jointed. The hinder antennæ of the male very long, folded zigzag, with short stem, very long fourth joint, and extremely short terminal joint. Oral cone thick and short, with compact mandibles and short maxillæ. *Both pairs of gnathopods are complexly subchelate.* Gland-cells in the third joint of the first, second, and third peræopods. The laminar first joints of the third and fourth peræopods elongate, comparatively not very broad. Third peræopods greatly elongated, having like the shorter fourth pair a strong first joint. Fifth peræopods with broad laminar first joint, (the limb) comparatively small, but with the full complement of joints. Peduncles of the first pair of uropods considerably elongated. Rami of the uropods lanceolate. Telson elongate. Inner ramus of the third pair of uropods coalesced with the peduncle."

The upper antennæ in my view should be spoken of as having a four-jointed flagellum, the first joint alone being massive; that which is in the definition spoken of as the fourth joint of the hinder antennæ is in my view the first joint of the flagellum of that pair.

Lycæa vincentii, n. sp. (Pl. CXCIX.).

Head rounded, first three segments of the peræon short, the second especially so, the seventh segment also very short; the skin sparsely spotted with pigment flecks.

Eyes covering the sides of the head, the ocular pigment very large.

Upper Antennæ.—The peduncle very short, the second and third joints almost evanescent; the first joint of the flagellum bulky, the convex lower margin long, the

thick brush of long filaments extending to its slightly produced apex, the upper margin making a very pronounced angle, so that its distal half might indifferently be reckoned as part of the apical margin; the second joint with a little basal lobe is inserted at the top of the true apical margin, and has near its apex seven or eight broad filaments; the third joint is narrower and rather shorter, with two filaments at a little distance from the apex; the fourth joint is of about the same length, much more slender, a little bulbous at the base, and carrying some setules at the tip.

Lower Antennæ.—The third joint of the peduncle nearly two-fifths of the length of the next joint, a little curved near the base, with little filaments along the margin as in the other joints; the fourth joint much more slender, elongate; the fifth in a slight degree exceeding the length of the fourth, more slender; the flagellum a little shorter than the last joint of the peduncle, its second joint being very short and the first very long.

Maxillipeds.—The inner plate is almost as broad as it is long, with two little embedded spinules at the centre of the distal margin; the broad apically rounded outer plates appear to have quite smooth edges.

First Gnathopods.—The first joint wider above than below, channelled in front; the second joint with convex hind margin; the third joint not underriding the fourth, much broader than long, its convex hind margin scarcely so long as that of the second joint; the wrist with very sinuous finely pectinate hind margin produced into a long sharp smooth tooth, the long sinuous distal margin having near this tooth a pectination of six or seven denticles; the hand, attached just within the apex of the wrist's front margin, folds upon its distal margin so as with its almost smooth hind margin nearly to reach the apex of the wrist's produced tooth; the distal margin of the hand has a close pectination of about thirteen little backward sloping denticles; the sharp curved finger is more than half the length of the hand and reaches considerably beyond its distal or palmar margin; it is bulbous at the base. Gland-cells show themselves in the first five joints of these and the five following pairs of limbs.

Second Gnathopods differing little from the first; the first joint longer and a little sinuous, the hinder apex of the wrist rather more strongly outdrawn, and the finger rather longer.

First Peræopods.—The branchial vesicles as in the other pairs very large, elongate oval, with many lateral accessory pockets. The first joint nearly straight, the second longer than broad, the third much broader and longer than the fourth, the fourth with its hind margin nearly smooth except round the distal part, the fifth joint narrower than the fourth, as long as the third or a little longer, its front margin pectinate; the finger small, smooth-edged.

Second Peræopods very similar to the first but longer, the increased length being chiefly noticeable in the third and fifth joints.

Third Peræopods considerably longer than the second. The first joint longer than

in the preceding pair, tending to oval, but with the hind margin flattened, almost entirely smooth edged, the other joints nearly as in the preceding pair, but the third and fifth joints are much longer, and the pectination of the fourth joint, especially round the distal margin, appears to be stronger.

Fourth Peræopods.—First joint not longer than in the preceding pair, but wider, with the hinder margin very convex; the third, fourth, and fifth joints scarcely so long as in the second peræopods, all three pectinate along the front margin; the pectination is also strong on the narrow distal margin of the fifth joint, which has some likewise on the lower part of its hind margin.

Fifth Peræopods.—The first joint much dilated, the breadth more than two-thirds of the length, and much surpassing the length of all the other joints together; these are all smooth-edged, the third longer than the second or fourth, the fourth not longer than the second, the fifth a little longer than the third, tapering; the finger minute, its base broad, triangular, the terminal part longer than the base, and bent sharply and closely back upon it, forming an effective hook.

Pleopods.—The coupling spines minute, with only the apical hooks; the cleft spine with very short arms, that with the subapical dilatation being the longer; the interlocking process on the outer ramus not elongate; the joints of the rami numbering from ten to eleven.

Uropods.—Peduncles of the first pair very much longer than the rami, extending back beyond the peduncles of the third pair, the outer edge folded in near the base, and below this pectinate; the rami equal, about a third of the length of the peduncles, carinate below, reaching back beyond the telson, the edges pectinately toothed except just near the base; the peduncles of the second pair a little longer than the inner ramus; the outer ramus narrower and shorter than the inner, its edges denticulate like all the other rami, its length a little exceeding that of the rami of the first pair; the inner ramus reaching just to the end of the peduncles of the first pair; the third pair have the peduncles short, widely separated, the inner ramus curving outwards, coalesced with the peduncle; the outer ramus is narrow, broken in the specimen, but from what remains pretty evidently not very elongate.

Telson not quite reaching to the apex of the third uropods, equal in length to the peduncles of the second uropods, the breadth about three-quarters of the length, narrowing to the apex, which is rounded, by no means acute.

Length.—From the front of the head to the back of the third pleon-segment the specimen measured one-fifth of an inch.

Locality.—April 26, 1876, off St. Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface; surface temperature, 73°·2. One specimen, male.

Remarks.—The specific name is taken from the place of capture. There are three

other specimens from the same locality probably belonging to this species, one of them a female (mounted in Canada balsam), which is almost covered with large stellate pigment-markings, and has numerous young ones. From "*Amphipronoë longicornuta*," Giles, this species is distinguished by having all the segments of the peræon distinct and by the curved rami of the third uropods.

Lycæa pauli, n. sp.

Upper Antennæ.—The upper margin of the large first joint of the flagellum not angled.

Lower Antennæ as in *Lycæa vincentii*.

Mandibles.—The cutting edge nearly straight, not broad, finely striated, with a slight prominence at the upper corner, the lower rounded; the secondary plate of the left mandible nearly as long as the principal. First joint of the palp longer than the two following together, and more than twice as broad as either; the third joint slightly longer than the second.

Gnathopods nearly as in *Lycæa vincentii*, but the distal or palmar margin of the wrists less hollowed, the serrate part of it being straight.

Third Peræopods.—The first joint broadly oval, narrow at the neck, distally broad, the much rounded and faintly serrate distal extremity of the hind margin projecting much behind the following joint; the third joint longer and broader than the fourth; the fourth strongly pectinate on its distal margin on the inner surface; the concave front margin of the fifth joint faintly pectinate.

Fourth Peræopods.—The first joint more regularly oval than that of the preceding pair, about the same length with that, but considerably narrower; the third, fourth, and fifth joints also narrower as well as shorter than in the third pair.

Fifth Peræopods.—The first joint longer than broad, nearly as broad as the first joint in the preceding pair, narrowed at the two extremities, the front margin straight, the hinder very convex; the second joint not longer than broad; the third a little longer; the fourth narrower than the third, longer than the second and third together; the fifth longer than the fourth; the finger very small, with a small protruding piece above, the bent tongue-like piece below extending much beyond this.

Pleopods with about ten joints to the rami.

Uropods.—Peduncles of the first pair scarcely twice as long as the rami, strongly pectinate on the outer margin; the rami reaching a little beyond the telson, the outer rather the longer, pectinate on both margins, the inner pectinate on the outer margin and lower part of the inner; inner ramus of the second pair pectinate on both margins, reaching much beyond the peduncle of the first pair; the outer ramus much shorter and narrower than the inner, pectinate on the inner margin; the coalesced inner ramus of

the third pair scarcely curved outwards, reaching a little beyond the rami of the first pair, pectinate on both margins; the much smaller outer ramus pectinate on the inner margin, more than half the length of the inner ramus.

Telson rather narrower at the base than in *Lycæa vincentii*.

Length, three-tenths of an inch.

Locality.—Station 108, August 27, 1873; off St. Paul's Rocks; lat. 1° 10′ N., long. 28° 23′ W.; surface; surface temperature, 78°. One specimen, male.

Remark.—The specific name is taken from the place of capture.

Lycæa pulex, Marion.

1874. *Lycæa pulex*, Marion, Ann. d. Sci. Nat., sér. 6, t. i. p. 13, pl. ii. fig. 2.

Locality.—Station 351, April 12, 1876; Atlantic, off coast of Africa; lat. 9° 9′ N., long. 16° 41′ W.; surface; surface temperature, 81°·8.

Remarks.—The specimen is in bad condition. The third uropods agree better with those which Claus figures for *Lycæa robusta* than with Marion's figure of these organs, but as Claus himself regards Marion's species as the young of his own *Lycæa robusta*, it seems correct to adopt Marion's specific name.

Genus *Paralycæa*, Claus, 1879.

1879. *Paralycæa*, Claus, Die Gattungen und Arten der Platysceliden, pp. 32, 40.
1886. ,, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 486.
1887. ,, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 33.
1887. ,, Claus, Die Platysceliden, pp. 56, 63.

For the shorter definition of the genus, see Note on Claus, 1879 (p. 493). Claus' fuller description is to the following effect:—

"The shape to a certain extent intermediate between *Lycæa* and *Eupronoë*. Anterior antennæ concealed in a deep frontal groove, in the male resembling those in *Lycæa*. Hinder antennæ in the male with short thick basal joint and very long terminal joint. Oral cone strongly projecting, with compact mandibles and widely divided maxillipeds. *Both pairs of gnathopods simple and elongate*. Third peræopods elongate, with elongate oval laminar first joint. Fourth peræopods much shortened, with broad almost triangular laminar first joint. Fifth peræopods reduced to a narrow curved little laminar first joint, succeeded by the rudimentary remnant of the limb bent hook-like. Peduncle of the first pair of uropods long and broad, that of the second pair somewhat shorter, the leaf-like inner ramus coalesced with the peduncle."

Paralycæa gracilis, Claus.

1879. *Paralycæa gracilis*, Claus, Die Gattungen und Arten der Platysceliden, p. 40.
1887. „ „ (?) Bovallius, Systematical List of Amph. Hyper., Bihang. till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 33.
1887. „ „ Claus, Die Platysceliden, p. 64, Taf. xx. fig. 1–11.

Head obliquely oval, mouth-organs much produced below it; peræon much shorter than pleon, each of the first three segments much shorter than any one of the last four; first three segments of the pleon together much longer than the remainder of the pleon; scale-markings of the integument conspicuous.

Eyes covering most of the head, showing no external trace of the division of each eye into two groups of ocelli.

Upper Antennæ in the female very small; the peduncle seemingly short, one-jointed, the flagellum two-jointed, its first joint much longer than the peduncle, bent at the base, and having a group of three or four broad filaments almost at the apex, the second joint quite small, but longer than broad, tipped with long filaments.

Lower Antennæ not present in the female.

First Gnathopods.—Side-plates with convex front margin. The first joint much bent, concave in front, with a little hair or setule here and there; second joint longer than broad, the hind margin convex; the third joint longer than the second, broader than the fourth, the hind margin convex; the fourth joint perhaps slightly longer than the third, the distal margin projecting a little obliquely beyond the fifth joint or hand; the hand narrower than the wrist and a very little longer, the front margin convex, the hinder straight, with a minute setule below the centre; the finger curved, slender, rather more than half the length of the hand, squarely widened at the base, the hind margin then regularly concave except for a small interruption where a minute setule emerges high up on the margin.

Second Gnathopods like the first, but all the joints rather larger, except the finger. Branchial vesicles oval, simple, broader than the first joint, not longer. The concave front margin of the first joint seems to be without setules, the third and fourth joints are equal in length, and each of them little longer than the second, and little shorter than the fifth.

First Peræopods not very different in appearance to the gnathopods, but considerably larger. The side-plates convex in front, the lower hind corner produced a little backwards. The first joint wider than in the gnathopods and less concave in front; the third joint much larger than the second, widened distally, with convex front margin; the fourth joint longer than the third, wider than the fifth and nearly as long, with a slight narrowing near the apex; the fifth joint slender, slightly curved, with a few little setules along the hind margin and one at the apex of the convex front; the finger not half the

length of the fifth joint, shaped as in the gnathopods, but without setule or interruption of the concave part.

Second Peræopods like the first, but with the third, fourth, and fifth joints longer.

Third Peræopods.—Side-plates with convex front and hind margins and a narrow tongue-like backward-directed process on the inner side. Branchial vesicles shorter than the first joint and not broader. The first joint slightly channelled behind, about three times as long as broad, fully as long as the three following joints together, its sides nearly straight; the second joint longer than broad, the third considerably longer than the second, the fourth than the third, and the fifth than the fourth; the fourth joint straight, very finely pectinate along the front margin; the fifth much narrower, scarcely curved, still more minutely pectinate; the finger as in the preceding pairs, but much smaller, about a sixth of the length of the fifth joint.

Fourth Peræopods.—Branchial vesicles shorter than the preceding pair. The first joint much longer than all the remaining joints together, little shorter, but in the upper part much broader than, the first joint of the third peræopods, the lower end of the broad oval much narrowed and smoothly rounded; the second joint very small, scarcely capable of reaching the apex of the first; the third joint longer than the remaining joints together, its front margin pectinate with retroverted teeth, the apical prolongation narrow, almost acute, not quite reaching the middle of the next joint; the fourth joint much longer and broader than the fifth, armed like the third except at the narrowed apical portion; the fifth joint slender, nearly straight, with a setule at the apex of the hind margin, the lower part of which is a little concave; the finger small and blunt, abruptly narrower than the fifth joint, and about a sixth of its length.

Fifth Peræopods very feeble, the narrow first joint a little curved, about half the length of the first joint of the fourth peræopods, and a fifth or a sixth of its greatest breadth; the hook-like appendage obscurely divided into four joints of which the second forms the bend, the terminal one having a rounded apex.

Pleopods.—Peduncles produced downwards at the inner angle; coupling spines very short, with the usual apical cap; one arm of the cleft spine having a long narrow dilatation, the other arm nearly equal; inner ramus with five joints, outer with six.

Uropods.—Peduncles of the first pair longer than the rami, three-edged, the outer margin pectinate below; the outer ramus longer than the inner, three-edged, the outer margin more strongly pectinate than the inner; the inner ramus laminar, its margins less strongly pectinate than those of the outer ramus; peduncles of the second pair rather shorter than the outer ramus; the outer ramus three-edged, almost smooth on the outer margin, the inner pectinate; the inner ramus rather shorter than the outer, coalesced with the peduncle, both margins pectinate; peduncles of the third pair shorter than the outer ramus; the outer ramus considerably shorter and narrower than the inner, the outer margin smooth, the inner pectinate; the inner ramus coalesced with the

peduncle, reaching beyond the other rami and the telson, both margins pectinate, the apex narrowly rounded.

Telson a long narrow triangle, with the sides slightly concave, and the apex smoothly rounded, the length not much less than that of the third uropods.

Length about three-twentieths of an inch.

Locality.—March 16, 1874, south of Australia; lat. 39° 22′ S., long. 140° 27′ E.; surface; surface temperature, 61°. One specimen, female, with eggs.

Remarks.—There seems nothing to distinguish this specimen from Claus' *Paralycæa gracilis*, of which the locality was unknown to Claus. Bovallius describes a species, from "Tropical parts of Atlantic," under this name, to which he assigns "body smooth, head twice deeper than body," and "exterior ramus of last pair [of uropods] as long as the interior." These particulars do not suit the Challenger specimen, nor does the last of them agree with Claus' figure of the species.

Paralycæa hoylei, n. sp. (Pl. CCX., E.).

Upper Antennæ as in the preceding species.

First Gnathopods.—First joint nearly straight, a little widened below, with half a dozen setules along the hind margin; the fourth joint or wrist decidedly longer than the third joint, with two minute setules on the almost straight hind margin; the fifth joint or hand slightly curved, narrower than the wrist and not longer, with a minute setule at the centre of the hind margin; the finger a little widened at the base.

Second Gnathopods.—Branchial vesicles simple, rather shorter than the first joint. Marsupial plates much larger than the branchial vesicles. The first joint longer and more sinuous than in the first pair, the second and third joints rather larger; the wrist not much longer than the third joint, rather shorter but broader than in the first gnathopods, the rather convex hind margin having a minute spinule below the centre and another at the apex which stands well clear of the hand; the hand rather longer than the wrist and longer than in the first pair, while the finger is rather shorter.

First and Second Peræopods nearly as in the preceding species; the first joint more curved than in the gnathopods; the fifth joint longer than the fourth.

Third Peræopods.—The first joint not widely expanded, about as long as the three following joints together, the second joint longer than broad, with convex front margin; the third joint much longer than the second, with straight hind margin and convex front; the fourth joint narrower than the third, not or scarcely longer, finely pectinate; the fifth joint narrower than the fourth and almost as straight, a little longer, finely pectinate; the finger small.

Fourth Peræopods.—The first joint longer than that of the third peræopods, widest above, with narrowly rounded apex, within and a little above which the small second joint is embedded; the third joint as long as the three following together, the produced apex of the inner surface being about half the width of the joint at its base and less than half the length of the following joint; the retroverted teeth of the front margin are graduated in size, the largest being within one or two of the small apical tooth; the fourth joint is oval, longer than the two following together, almost as broad as the third and pectinate like it, except that the channelled distal part of the front margin is free from teeth; the fifth joint about half the length of the fourth and not a third of its breadth; the finger scarcely half as long or as broad as the fifth joint, straight, not acute; the last five joints are together much shorter than the first.

Fifth Peræopods.—First joint about three times as long as broad, seemingly with both margins a little sinuous, the terminal appendage small, not well observed.

Pleopods as in the preceding species.

Uropods.—Peduncles of the first pair a little longer than the rami, the apex of the inner margin a little produced, the lower half of the outer closely pectinate; the rami as in the preceding species; peduncles of the second pair fully as long as the rami, shorter and much narrower than those of the first pair, with the lower part of the inner margin pectinate; the rami pectinate as in the preceding species, the inner very slightly the shorter, not at all coalesced with the peduncle; the third pair as in the preceding species, but a small indent on the inner margin marking the point of coalescence between the ramus and peduncle.

Telson as in the preceding species, but scarcely so long compared with the third uropods.

Length, one-tenth of an inch.

Locality.—Station 351, April 12, 1876; Atlantic, off coast of Africa; lat. 9° 9′ N., long. 16° 41′ W.; surface; surface temperature, 81°·8. One specimen, female.

Remarks.—The species is named as a mark of respect to Mr. W. E. Hoyle of the Challenger Office, who has seen a large part of this Report through the press. From *Paralycæa newtoniana*, Bovallius, which also has the inner ramus of the second uropods free, this species is distinguished at once by the process to the third joint of the fourth peræopods.

Genus *Simorhynchotus* (*Simorhynchus*,[1] Claus, 1871).

1871. *Simorhynchus*, Claus, Unters. über den Bau und die Verw. der Hyperiden. Nachrichten der K. Gött. Soc., p. 156.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, pp. 32, 42.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 486.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 34.
1887. „ Claus, Die Platysceliden, pp. 56, 65.

For the shorter definition of this genus by Claus, see Note on Claus, 1879 (p. 493). The following is based upon the fuller account which he also gives both in 1879 and 1887 :—

Upper Antennæ with four-jointed flagellum, the first joint very large, the others narrow.

Lower Antennæ.—The first free joint (in the male) curved, much shorter than any of the three following joints, which are long and linear, the terminal joint short.

Mandibles with three-jointed palp (in the male).[2]

Maxillæ degraded.

Maxillipeds with small inner plate and large outer plates.

First Gnathopods simple; *Second Gnathopods* tending to a subchelate form.

Third Peræopods longer than the *Fourth*, both pairs with expanded first joint.

Fifth Peræopods with expanded first joint, the remaining joints present but feeble.

Branchial Vesicles large, with accessory lateral compartments.

Uropods of the *Second* and *Third* pairs having the inner ramus coalesced with the peduncle, the outer movable, finger-like.

Claus states that the ganglia in the ventral chain (which he figures) are very closely set, with short longitudinal commissures; that the hepatic tubes (which he also figures) are broad, with secondary bulgings; and that the heart (Rückengefäss) is very wide. His description of the rodent-like head must no longer be included in the generic account, since Bovallius describes a species, "*Simorhynchus Lilljeborgi*," with "Head rounded, not rostrate."

Simorhynchotus antennarius (Claus) (Pl. CC.).

1871. *Simorhynchus antennarius*, Claus, Untersuch. über den Bau und die Verwandschaft der Hyperiden, Nachrichten K. Gött. Soc., p. 156.
1879. „ „ Claus, Die Gattungen und Arten der Platysceliden, p. 43.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 34.
1887. „ „ Claus, Die Platysceliden, p. 65, Taf. xvii. figs. 9–19.

Head broad, produced a little in front, as if into a short blunt snout; the back broad, the segments of the peræon together not so long as the first three of the pleon; the

[1] *Simorhynchus*, being preoccupied among birds (see Scudder, Nomenc. Zool., p. 292), has been changed into *Simorhynchotus*.

[2] Claus says "Mandibular-palp short, basal joint only a little longer than the following joints," whereas in the Challenger specimen the palp is relatively long, and its basal joint considerably longer than the second joint.

side-plates with the upper boundary not very distinct; the first three segments of the pleon large, with the postero-lateral angles not acute.

Upper Antennæ attached below near the front of the head; the first joint of the peduncle about as broad as long, the second very short, the third obscure or absent; the first joint of the flagellum large, strongly bent, the long convex margin surrounded by a dense fringe of long filaments, the apex produced about to the end of the second joint, with the margin facing that joint ciliated; adjacent to the upper margin of the joint there is a second brush of filaments and this margin has an elevated process at a little distance from the apex; the small second joint is longer than broad, with filaments near and at the apex; the third joint is much shorter and narrower, with filaments near the apex and setules at it; the fourth joint is as long as the two preceding together, at first a little bulbous, then filiform, tipped with setules. In Claus' figure the apex of the first joint of the flagellum is more strongly produced, the third joint is as long as the second, and the fourth is linear, little longer than either of the preceding joints.

Lower Antennæ attached at the lower part of the back of the head; the third (first free) joint of the peduncle curved, rather elongate, thickest near the base; the fourth joint narrower, broken in our specimen. Claus says that the fourth joint reaches almost to the pleon, and the following joint is equal to it in Claus' figure; according to that figure the first joint of the flagellum is nearly as long as the last of the peduncle, while the second or terminal joint is extremely short.

Upper Lip a small dome, rather wider than deep.

Mandibles.—The trunk very small, compared with the palp, the cutting edge with a slightly produced tooth at the top, the remainder very finely denticulate, straight; the first joint of the palp longer and broader than either of the others; the second a little widened at the base, curved, shorter than the third; the third more curved and narrower than the second, apically pointed. Claus, in the character of the genus, states that the first joint of the mandibular palp is only a little longer than the following joints, and in fact figures the third joint of nearly equal length with the first.

Maxillipeds.—The inner plate about as long as broad, not half the length of the outer plates, which are rather broad at the base, the apices rounded, not meeting over the inner plate, the margins smooth.

First Gnathopods.—The first joint longer than all the rest together, with the hind margin nearly straight, the front sinuous, the two ends of the joint being narrow, the middle a little dilated; the second joint not broader than long, the third a little longer, with one little setule on the hind margin; the wrist a narrow oval, longer than the hand, with a little setule and two hairs on the hind margin; the hand narrow, with the hind margin straight, armed below with three tiny setules, the front margin convex; the finger small, acute, less than a third of the length of the hand, with a minute setule on the hind margin.

Second Gnathopods very like the first, but the first joint longer and rather more slender, and the wrist widening distally, with straight or slightly concave distal margin forming the widest part of the joint and projecting much behind the hand, the hind margin furnished with five setules or spinules successively larger, and three submarginal hairs or setules, besides a little excessively fine furring.

First Peræopods.—The first joint narrowest at the neck, the front margin straight; the second joint longer than broad; the third joint subequal in length to the fourth, which is a little narrower and slightly curved; the fifth joint longer and narrower than the fourth, slightly curved, the concave hind margin of this and the preceding joint faintly furred; the finger bulbous at the base, very slightly curved, less than half the length of the fifth joint. There are microscopic setules on various parts of the limb.

Second Peræopods like the first, except that they are slightly stouter, and the third, fourth, and fifth joints are longer.

Third Peræopods much longer than the preceding pairs, the first joint not widely expanded, more than twice as long as broad, with some small spines along the upper part of the front margin which below is weakly serrate; the second joint longer than broad; the third and two following joints much more elongate than in the preceding pair, the third rather longer than the fourth; the fifth slender, curved, much longer than either of the two preceding joints, nearly as long as the first; the finger small, about a sixth of the length of the preceding joint.

Fourth Peræopods shorter than the third, the first joint rather longer and at the upper part much more widely expanded, the front margin produced a little below the hinder, and having a few spines, the convex hind margin smooth; the second and third joints rather larger than in the preceding pair, the third joint having its distal margin finely pectinate and armed on either side with a couple of spines; the fourth joint about half the length of the third, the distal armature similar, but the pectination much stronger, the front margin very minutely pectinate at the middle, but at a little distance from the apex carrying four short broad teeth; the fifth joint longer than the third, curved, the concave front margin strongly pectinate; the finger small.

Fifth Peræopods.—The first joint narrowly pear-shaped, not so long as the first joint of the third pair, but as broad at its broadest part; the second joint not longer than broad; the third about twice as long as the second; the fourth nearly twice as long as the third, but narrower; the fifth nearly as long as the fourth; the minute finger projecting in front of the fifth joint and strongly bent, so that the linear or setiform termination is brought very near to the base and projects in advance of it.

Pleopods.—Coupling spines minute; cleft spine having the arm with the subapical dilatation considerably longer than the other; the first joint of the inner ramus carrying five setæ below the cleft spine; the first joint of the outer ramus longer than

that of the inner, with six or seven plumose setæ on the outer and two or three on the inner margin; joints of each ramus numbering eight or nine.

Uropods.—Peduncles of the first pair reaching just beyond the bases of the third pair, a little longer than the outer ramus, probably a little shorter than the inner; the outer ramus narrower and no doubt shorter than the broken inner ramus, closely pectinate along both margins, curving a little inwards; the inner ramus curving a little outwards, more loosely pectinate on the inner than on the outer margin; both rami carinate on the under surface; the second pair altogether missing on one side and on the other perhaps incompletely developed, the peduncle much shorter and narrower than the peduncles of the first pair, on the inner side bluntly produced for less than half the length of the small outer ramus, which scarcely reaches to the end of the peduncle of the first pair; peduncles of the third pair completely coalesced with the inner ramus; the outer ramus, to judge by the one remaining stump, is evidently narrow and probably short; the inner ramus apart from the distally widened peduncle is rather shorter than the outer ramus of the first pair, the first half broad, with both margins convex, the terminal half narrow; the margins are pectinate, the under surface carinate, the terminal part of the ramus bending outwards, the whole ramus not quite twice as long as the peduncle, with which its inner margin is completely continuous.

Telson on the upper surface quite coalesced with the preceding composite segment, which it exceeds in length; the breadth at the base about equal to the length; the sides for much of the length convex, converging very slightly, distally a little concave, converging rapidly to an almost acute apex halfway down the narrow part of the inner ramus of the third uropods.

Length, in the somewhat bent position figured, a quarter of an inch.

Locality.—April 13–14, 1876, Atlantic, off coast of Africa; lat. 11° 5′ N., long. 18° 15′ W.; surface; surface temperature, 74°·7. One specimen, male.

Remarks.—The small differences in the upper antennæ and mandibular palp between this specimen and that described by Claus are evidently not of specific value. The first joint of the fourth peræopods and the finger in the fifth do not agree with Claus' figures, but he does not specially describe those parts; there are also differences in the uropods, but, as already observed, the Challenger specimen may be a little abnormal in this respect.

Family Oxycephalidæ, Spence Bate, 1862.

Dana in 1852 made the Oxycephalinæ the third subfamily of the Typhidæ. Spence Bate in 1862 established the Oxycephalidæ as the fifth family of the Hyperina, including in it two subfamilies, the Synopiades and Oxycephalides. By later writers the Synopiades

have been classified elsewhere. In 1879 and 1887 Claus placed the Oxycephalidæ as the fifth family of the Platyscelidan group, and defined it to the following effect:—

"Body more or less laterally compressed and elongate, with long rostrum, the pleon extensive, with stiliform uropods. The branchial vesicles are elongate, simple. The laminar first joints of the third and fourth peræopods thin and comparatively weak. Fifth peræopods very weak, but generally complete. The hinder antennæ of the female and both pairs of maxillæ degraded. Two otolith-vesicles are uniformly present."

Claus includes in the family only the two genera, *Oxycephalus* and *Rhabdosoma*, for which Dana originally formed the subfamily Oxycephalinæ. Streets added the genus *Leptocotis* in 1877 and *Calamorhynchus* in 1878. Bovallius in 1887 added the genera *Glossocephalus* and *Tulbergella*, changed the name *Rhabdosoma* into *Rhabdonectes*, and gave the following diagnosis of the family:—

"Head long, produced anteriorly into a rostrum. Eyes large, not occupying the whole head. First pair of antennæ fixed at the under-side of the head in a special groove between the rostrum and the eyes; first joint of flagellum tumid, the rest subterminal, few-jointed. Second pair fixed at the under hinder corner of the head, angularly folded (♂) or wanting (♀). Pereiopoda [*Gnathopods* and *Peræopods*] are walking legs. Seventh pair [*Fifth Peræopods*] complete or rudimentary."

The expression "pereiopoda are walking legs" is rather obscure, and not applicable to the gnathopods.

Genus *Oxycephalus*, Milne-Edwards, 1830.

1830. *Oxycephalus*, Milne-Edwards, Ann. d. Sci. Nat., t. xx. pp. 385, 396 (extr., pp. 34, 45).
1832. *Orio* (*pars*), Cocco, Effemeridi scient. e lett. per la Sicilia, t. ii. N. 6.
1833. „ „ Cocco, Giornale di Scienze Lettere e Arti per la Sicilia, t. xliv.
1833. „ Prestandrea, Effemeridi scient. e lett. per la Sicilia, t. vi. N. 16.
1836. *Oxycephalus*, Guérin, Magasin de Zoologie, t. vi. Cl. vii. p. 9.
1838. „ Milne-Edwards, Hist. nat. des Anim. sans vertèbres, t. v.
1840. *Orio* (*pars*), O. G. Costa and A. Costa, Catal. de' Crost. del Regno di Napoli.
1840. *Oxycephalus*, Lucas, Hist. Nat. des Crust., Arachn. et Myriap., p. 240.
1840. „ (*pars*), Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 99.
1849. „ Nicolet, Historia fisica y politica de Chile por Claudio Gay, Zool., t. iii.
1850. *Ornithoramphus*, de Natale, Descr. Zool. di alcuni crost. del porto di Messina.
1850. *Erpetoramphus*, de Natale, Su pochi Crostacei del porto di Messina (See Appendix).
1851. *Orio* (*pars*), Costa, in Hope's Catal. dei Crost. Ital., p. 21.
1851. *Ornithorhamphus*, Costa, in Hope's Catal. dei Crost. Ital., p. 21.
1851. *Erpetorhamphus*, Costa, in Hope's Catal. dei Crost. Ital., p. 22.
1852. *Oxycephalus*, Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pt. ii. pp. 1009, 1443.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 342.
1864. *Natalius*, Costa, Rend. della R. Acad. delle Sci. Fis. e Matem. di Napoli, Fascicolo iv.
1864. *Carcinornis*, Costa, Rend. della R. Acad. delle Sci. Fis. e Matem. di Napoli, Fascicolo iv.
1871. *Oxycephalus*, Claus, Unters. über den Bau und Verwandschaft der Hyperiden, Nachrichten K. Gött. Soc., p. 155.

1877. *Oxycephalus*, Streets, Bulletin U.S. Nat. Mus., No. 7, p. 136.
1878. „ Claus, Ueber Herz und Gefass-system der Hyperiden, Zool. Anzeiger, Jahrg. i. p. 207.
1878. „ Streets, Proc. Acad. Nat. Sci. Philad., p. 278.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, pp. 43, 44.
1884. „ Claus, Lehrbuch der Zoologie, trans. by Sedgwick, p. 455.
1885. „ Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 427.
1885. ? *Natalius*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 427.
1885. ? *Carcinornis*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 427.
1885. ? *Ornithorhamphus*, Carus, Prodromus Faunæ Mediterraneæ, pars ii. p. 428.
1886. *Oxycephalus*, Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 487.
1886. „ Thomson and Chilton, Trans. New Zealand Inst., vol. xviii. p. 151.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 35.
1887. „ Claus, Die Platysceliden, p. 68.

For the original definition of the genus *Oxycephalus*, see Note on Milne-Edwards, 1830 (p. 143). For the definitions of *Orio*, see Note on Cocco, 1832 (p. 145), 1833 (p. 150), and compare Note on Prestandrea, 1833 (p. 152). For the account of *Ornithoramphus*, see Note on de Natale, 1850 (p. 239). For *Erpetoramphus* see Note on de Natale, 1850 (Appendix, p. 1623). For the definitions of *Natalius* and *Carcinornis*, see Note on Costa, 1864 (pp. 346, 347). For an independent definition of *Oxycephalus*, see also Note on Nicolet, 1849 (p. 232). For a short definition by Claus, see Note on Claus, 1879 (p. 493). Those who have access to the specimens on which the Italian authors mentioned in this synonymy founded their genera may be able to uphold some of those genera as distinct, or to show that they have anticipated some of the genera more recently instituted. Claus' fuller definition of *Oxycephalus* is to the following effect :—

" Body elongate, in the female sex having the peræon widened. Head outdrawn in a tolerably triangular rostrum, the base of which receives the anterior antennæ in a deep groove-like excavation of the ventral surface. From this a flat channel extends on the under-side of the head to the mouth-organs for the reception of the long zigzag folded second pair of antennæ. The anterior antennæ end with a short two- to three-jointed flagellum, and in the male are strongly swollen, weakly curved, and carry a thick brush of close-set olfactory filaments. The hinder antennæ of the male are five-jointed, folded zigzag and end with a short terminal joint, while in the female they are completely wanting. Mandibles powerful, with sharp tooth-like projecting cutting edge, attached to the rim of the tumidly prominent epistome. In the female without palp, in the male they carry one that is elongated rod-like, reaching to the anterior antennæ ; its two distal joints lie angularly curved and form a sort of hook-like termination. Maxillæ were not found. The maxillipeds are represented by a three-leaved under-lip. The two short pairs of gnathopods are complexly chelate ; uniformly is the chela of the first pair shorter, more compact, and armed with sharper edge to the finger-joint. The first joints

of the third and fourth peræopods have a laminar expansion. The fifth peræopods more or less reduced, but having the full number of joints, the first triangularly laminar. The uropods with two lanceolate rami. The telson triangular."

Without being able to give any definite information as to the lower lip and maxillæ in this genus and the other genera of the same family, I may express an opinion that these organs are not absolutely unrepresented, but that they consist of delicate and more or less rudimentary plates, which are almost inevitably torn and disfigured when the mandibles are drawn away from the maxillipeds.

Oxycephalus clausi, Bovallius, ♀ (Pl. CCI.).

1879. *Oxycephalus piscator*, Claus, Die Gattungen und Arten der Platysceliden, p. 44.
1887. *Oxycephalus clausi*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 35.
1887. *Oxycephalus piscator*, Claus, Die Platysceliden, p. 69, Taf. xxii. figs. 1–9, Taf. xxiii. figs. 1–8.

The back carinate from the tip of the rostrum to the apex of the telson, the carina interrupted by depressions between the segments of the peræon and to some extent by depressions across the segments of the pleon; the proximal half of the head of a bulbous oval form, almost entirely occupied by the great eyes with their innumerable ocelli; the distal half a triangle much longer than broad, the end rounded except quite at the apex, which forms a small point; the outer margin of the whole head serrate; viewed laterally the outer or lower margin is sinuous, convex at the eye, concave at the rostrum which forms a sort of prismatic base, along the underside of which lie the two little antennæ. On either side of the central carina, a lateral carina is developed in a more or less disconnected manner, as well on the rostrum as on the segments of the peræon and the first three of the pleon; of these latter the postero-lateral angles are produced into sharp points, above and beyond each angle the hind margin being also produced into a sharp point, with a faintly serrate cavity below and a convex or sinuous tract above; the coalesced fifth and sixth segments are equal in length to the telson, and coalesced with it. Much of the animal is finely scabrous.

Upper Antennæ but little exceeding in total length the breadth of the wrist of the second gnathopods. The first joint about three times as long as broad; the second joint very short, twice as broad as long; the first joint of the flagellum longer than the peduncle, fringed on the outer side with about eighteen short filaments; the second joint about a fifth of the length of the first and much narrower, with a subapical pair of short filaments; the third joint shorter than the second, linear, a little curved, tipped with a spinule.

Lower Antennæ wanting (in the female).

Upper Lip transversely oval.

Mandibles small, the distal end triangular, the lower edge of the triangle being the striated cutting edge; the secondary plate of the left mandible is nearly as large as the principal, and similar except that it has not a projecting tooth at the top; on the right mandible there is a small process shaped like a broad broken spine.

Maxillipeds.—The inner plate and the joint to which it is attached carinate down the centre on the inner side, its distal margin arched; the outer plates curving over the inner one, with sinuous inner margins, at first convex, then concave, fringed with seven small tubercles, in each of which a short setule is planted.

First Gnathopods.—Side-plates much deeper than broad, produced below to a sharp point, the lower part of the concave front margin and all the lower margin serrate, the hinder margin rounded below. The first joint attached a little above the middle of the side-plate and not reaching much below it, the hind margin convex, the front still more bowed, except at its two extremities; the second joint very short, broader than long, with a spinule near the hinder apex; the third joint very little longer, somewhat broader than the second, with a spinule similarly placed but longer; the wrist broader than the first joint and behind about as long; the front margin convex, with a spinule near the apex, the wrist here attaining its greatest breadth; the hind margin much longer than the front, convex at the base, thence running in almost a straight line to form a long apical tooth, the inner margin of the process being cut into two or three smaller teeth, the outer surface carrying a few spines and the inner surface crossed by a large group; the hind margin is bordered with eight spinules, and along the distal half serrate, and minutely pectinate between the serrations; the very convex front margin of the small hand is not continuous with that of the wrist, but set considerably back, while the straight, finely but irregularly denticulate, hind margin overlaps without reaching beyond the inner margin of the process of the wrist; numerous spines planted on the surface of the hand within its hind margin antagonize with those on the inner surface of the wrist; the finger is very small, set on the front of the apex of the hand, curving over the short remaining part of the faintly produced apical margin and across the sharp apical tooth of the wrist; there are small spines on the front margin and distributed on both surfaces of the distal part of the hand.

Second Gnathopods.—Side-plates with the front margin almost straight and smooth, directed obliquely forwards, deeper than the hind margin; the lower margin serrate, slightly sinuous. Branchial vesicles oval, a little longer and much broader than the first joint, speckled over with little hairs. The limb not unlike that of the first gnathopods, but much larger; the first joint a little sinuous, not quite so long as the wrist; the second and third as in the preceding pair, but larger; the wrist very broad, and more than twice as long as it is broad, the proximal part muscular; the hind margin convex, fringed with spinules, the distal two-fifths forming a triangular thumb, the apex of which reaches beyond the hand, the inner or front margin of the process being slightly concave,

divided into blunt teeth, of which five or six are conspicuous, the rest near the apex being small; the front margin is only slightly convex, and has a sharp apex, a little bent, with a small cavity behind it containing a spinule; between this and the thumb the distal margin is nearly straight; the hand set on as in the preceding pair, widens beyond the neck, and then tapers to the truncate apex, the front margin being convex, the hinder gently crenate, scarcely convex; the finger very short, its base occupying nearly all the apex of the hand, its tip curving across the tip of the thumb; there are spinules along the hind margin of the wrist, and near the teeth of its distal process, also near the margins and on the surface of the hand. In both the first and second gnathopods there are gland-cells in the first five joints.

First Peræopods.—Side-plates deeper behind than in front, the front margin convex the other margins sinuous, the lower serrate. The branchial vesicles long oval, not so long as the first joint. The limb long and slender; the first joint concave in front, a little widened distally, almost free from the side-plate, as long as the three following joints united, having a longitudinal ridge on the under surface; the second joint not shorter than the breadth, carrying two spinules on the convex hind margin; the third joint rather longer than the fourth, with some very small spinules on the slightly convex front margin, the hind margin nearly straight, fringed with numerous out-standing spinules; the fourth joint not much narrower, similarly armed; the fifth subequal in length to the fourth, similarly armed, a little curved, distally tapering; the finger slender, acute, a little curved, scarcely more than a fifth of the length of the fifth joint.

Second Peræopods.—Side-plates rather broader than in the preceding pair, branchial vesicles and limbs similar, but the joints rather longer, except the second and the finger; the fourth joint not quite so long as the fifth.

Third Peræopods.—Side-plates a good deal broader than deep, the hind lobe the larger, with its lower margin flattened; on the inner side there is a narrow tapering process directed downwards. Branchial vesicles subequal in length to the first joint, but not so broad. The first joint greatly expanded, rather longer than the first joint of the preceding pair, irregularly oval, narrower at the base than distally, the hind margin very convex and regular, finely not deeply serrate, the front margin nearly straight in the upper part, carrying a few spinules, the lower part convex, strongly serrate, its apex produced into a sharp point, the distal margin sinuous; the rest of the limb slender, similar to the preceding pair, but with the third and fifth joints considerably, the second and fourth a little, longer and somewhat thicker, the second joint with a minute spinule in a notch above the front apex.

Fourth Peræopods.—The side-plates as deep as the preceding pair, not so broad, the front and hind margins nearly straight, but the front rounded at the lower corner, the hinder produced into a small projection. The branchial vesicles broadly oval, but not so

long or so broad as the first joint. The first joint tending to circular, a little shorter than the first joint of the preceding pair, but broader, similarly armed, the distal end the narrowest part, with a sinuous margin; the remaining joints similar in general shape to those of the preceding pair but shorter, the fourth and fifth much shorter, the third joint longer than the fifth; the front margin of the third, fourth, and fifth joints pectinate, the larger teeth interspaced with minute teeth, of which there are some also on the distal margins and a few on the inner margin of the almost straight finger near the base.

Fifth Peræopods.—The side-plates produced below and in front into a small lobe, the lower margin to the rear of the lobe nearly straight, forming a right angle with the slightly convex hind margin, above which the plate is separated from its segment by an incision extending for about one-third of the total breadth. The first joint papyraceous, pear-shaped, as long as the first joint of the fourth peræopods, and near the base two-thirds as wide, distally greatly narrowed; the remaining joints linear, together not quite so long as the first, the whole limb much more than half the length of any preceding pair; the second joint short, with a spinule on the convex front margin; the third as long as the three following united, narrowing a little distally, the front margin nearly straight, with some minute spinules, a long oval packet of gland-cells filling most of the joint; the fourth joint much narrower than the third, rather longer than the fifth; the fifth much narrower than the fourth, tapering to a very small sharp nail, which looks like the sharp point of a pencil cut with a narrow stalk.

Pleopods small in proportion to the size of the animal; the peduncles large in proportion to the rami, filled with strong muscles, the general appearance oval, but the front margin flattened, the hind margin double, strongly convex, the rim of the outer surface projecting a little beyond that of the inner; the coupling spines two in number, very short, the apex forming a circular cap of retroverted hooks; on one of the peduncles there were three coupling spines, but this might be abnormal; the cleft spine having a broad subapical dilatation of the longer arm; the joints of the rami numbering from eleven to thirteen or fourteen, the inner ramus slightly the longer but with fewer joints.

Uropods.—Peduncles of the first pair considerably longer than the rami, both the upper edges pectinate, the outer margin at the base folded on to the upper surface; below there is a central longitudinal ridge or carina, with another on either side of it; the inner ramus is longer than the outer, with a narrower neck, and reaches back a little beyond the third uropods; both rami are acutely lanceolate, with pectinate edges, and carinate below; the outer edge of the outer, and the inner of the inner, nearly straight; the peduncles of the second pair widen till they reach the base of the rami, not extending quite to the base of the telson, on the inner side terminating in a small sharp point; the outer ramus is the shorter and much the narrower; the inner, which does not reach so far as the apices of either of the other pairs, is firmly coalesced with the peduncle, broadly lanceolate, acute, and like its fellows pectinate and ridged; the third uropods

are constructed like the second but are smaller, the peduncle proper about half the length of the telson.

Telson long, lanceolate, very acutely pointed, reaching just beyond the first uropods, the edges pectinate; the length is about equal to that of the preceding double segment, to which it is itself firmly coalesced.

Length.—The specimen, in the position figured, measured, in a straight line from the tip of the rostrum to the back of the second pleon-segment, seven-twentieths of an inch.

Localities.—Station 104, August 23, 1873; Equatorial Atlantic; lat. 2° 25′ N., long. 20° 1′ W.; surface to 100 fathoms; surface temperature, 78°. One specimen, female with eggs.

Station 347, April 7, 1876; Equatorial Atlantic; lat. 0° 15′ N., long. 14° 25′ W.; surface; surface temperature, 82°. One specimen, with a shorter rostrum.

Remarks.—The specimen above described is undoubtedly the same as Claus' *Oxycephalus piscator*. Claus gives for the synonymy of his species "*O. piscator* Edw., Ann. scienc. nat. l.c. [xx. p. 396] 1830. *O. oceanicus* Guérin, Mag. de Zool. l.c. [t. vi. Cl. vii.] 1836. *O. tuberculatus* Sp. Bate, Catalogue of the spec. etc. 1862. *O. tuberculatus* Streets, Proceedings of the Acad. of Nat. Sciences of Philadelphia 1878." It is quite possible that the specimens referred to, or some of them, may belong to the present species, but the evidence is defective. Guérin's species is apparently smooth-bodied and is said to have the telson longer than the preceding segment; in the Brit. Mus. Catal. Amph. Crust., pl. liv., figure 3. *s.t.u.z.* is probably taken from Guérin and by accident wrongly numbered as if belonging to *Oxycephalus piscator*, M.-Edw.; Milne-Edwards does not say that his species is tuberculated, nor does he show the character of the margins of the first three pleon-segments, a character which separates the species above described from *Oxycephalus edwardsii*, G. M. Thomson. *Oxycephalus tuberculatus*, Spence Bate, is figured as though the margins of the pleon-segments were not excavate, the fifth peræopods are stated to be rudimentary, not so long as the first joint of the preceding pair, and the second uropods are said to have the margins of the rami smooth. Under the circumstances it seems necessary to adopt the name *Oxycephalus clausi*, Bovallius, both for the specimen here described and for those specimens which Claus has named *Oxycephalus piscator*, since the diagnosis given by Bovallius for *Oxycephalus clausi* is in essential agreement with the specimens in question, whereas the accounts accompanying the earlier names either differ from these specimens or leave points of importance undetermined. Bovallius assigns to Spence Bate's species from the Cape of Good Hope, "rami of second pair of uropoda serrated," but this is probably only a misprint for "not serrated." As the habitat of Milne-Edwards' species Bovallius gives "Atlantic, Mediterranean, Indian Ocean, Pacific," while Milne-Edwards only says "Paraît avoir été trouvé dans l'océan Indien."

Oxycephalus clausi, Bovallius (*?*), (Pl. CCII.).

The rostral tract of the head much shorter than the ocular, with the edges scarcely serrate ; the head only slightly constricted at the base ; a faintly marked central carina along the back of the head and peræon, tuberculated along the peræon, and accompanied by two similar lines at intervals on either side ; the first three segments of the pleon have the lateral carinæ less conspicuous, the remaining segments being apparently without them; the first segment of the pleon is the largest, the next three successively diminishing in length and depth ; the postero-lateral angles of the first three segments produced into a short sharp point, behind which, at some distance, the hind margin forms a similar point, from which in the third segment, it runs forward parallel to the lower margin ; the margins serrate near the produced points.

Eyes large, nearly twice as long as the portion of the rostrum beyond them, not meeting at the top of the head.

Upper Antennæ with their bases in front of the eyes, pointing backwards as they lie in the ventral cavity of the head ; the peduncle broad, the first joint widening from the base, scarcely longer than its greatest breadth ; the second joint as wide as the first, only about a third as long ; the first joint of the flagellum apically tapering, much longer than the peduncle, with transverse rows of filaments ; the three following joints linear, bending outwards, much shorter than the first joint, the second joint about equal in length to the two following united, much broader, with a setule near the apex on the outer side ; the third joint not half the length of the fourth ; the fourth tipped with three setules.

Lower Antennæ consisting of four stout joints folded upon one another, the first a little longer and stouter than either of the two following, the fourth a good deal shorter and thinner ; the first three widen a little distally with a slight curve, the fourth distally becomes narrow and straight, then tapering to a rounded end. This form does not represent the full development of these organs.

Mandibles small, of the same form as in the female, but with a palp, of which the first joint is not quite so long as the last of the lower antennæ, longer than the second and third joints together ; the second shorter than the third ; the third tapering to an acute apex, curving inwards.

Maxillipeds small, the outer plates not reaching far beyond the inner one.

First Gnathopods much smaller than the second, yet not so much so as in the Atlantic specimen, with which in general they agree.

Second Gnathopods similar to those of the Atlantic specimen, but the long hind process of the wrist has an almost smooth margin facing the hind margin of the hand, most of which is finely serrate ; the hand is as long as the front margin of the wrist. In the female specimen the process of the wrist has the inner margin tuberculated as in the

Atlantic specimen, though far less strongly; the smoothness of the margin in question is probably a juvenile character.

First and Second Peræopods similar to those of the female already described. The branchial vesicles of these and the two following pairs having short transverse pockets or folds.

Third Peræopods differing from those of the previous description chiefly in the first joint which is elongate oval, more convex at the finely serrate hind margin than at the front, which is armed with two or three spinules in the upper part, and serrate at six points in the lower, the breadth being about the same at the proximal and distal ends.

Fourth Peræopods differing from those of the Atlantic form in the first joint, which is rather pear-shaped than circular, a little shorter than the first joint of the third pcræopods, much broader above, but at the distal end a little narrower, both margins strongly convex at the upper part, especially the hind margin, the front margin in the lower half tending rather to concave, serrate at six or seven points.

Fifth Peræopods.—The pear-shaped first joint shorter as well as much narrower than that of the fourth peræopods, less strikingly narrowed before reaching the distal end than in the Atlantic specimen. The remaining joints feeble, together much shorter than the first; the third not greatly longer than the fifth, the fifth a little longer than the fourth; the nail very small, spine-like. In the female specimen these limbs are very nearly as in the Atlantic specimen, but the first joint has not the narrowed distal part so much prolonged.

Pleopods similar to those already described.

Uropods similar to those of the Atlantic form, but with the inner ramus of the first pair reaching just beyond the telson, the inner apex of the third pair being almost or quite level with the apex of the telson.

Telson shorter than the double segment, with which it is coalesced, not nearly twice as long as broad; the lateral margin smooth or nearly so above, strongly pectinate below; the apex acute. In the female specimen more elongate, yet not quite so long as the preceding segment.

Length.—The female specimen from which the full figure was taken, measured, in the position figured, in a straight line from the apex of the rostrum to the distal end of the first uropods, almost three-quarters of an inch, the full length when extended being rather over an inch. The male specimen from which the details were drawn was a good deal smaller, measuring about half an inch in a slightly bent position.

Locality.—July 1875, North Pacific, between Japan and Honolulu; surface. Four specimens.

Remarks.—It will be noticed, as an example of the correlation of parts, that the short telson in the specimen here described goes with a short rostrum, as in the Atlantic

specimen a longer telson with a longer rostrum, but these parts are certainly variable within the species. It would no doubt be possible to make out a case for distinguishing the Pacific from the Atlantic specimens as different species, and on the other hand something might be said for grouping both sets under the name *Oxycephalus tuberculatus*, Spence Bate, or the older and still more vague title, *Oxycephalus piscatoris*, Milne-Edwards; another species, *Oxycephalus edwardsii*, G. M. Thomson, 1884, makes a very close approach to the forms which are here described, but there are some differences in the gnathopods, the first joint of the fifth peræopods is particularly slender, and the double segment in the pleon is very decidedly longer than the telson in Mr. Thomson's species.

A plate with the signature " R. v. W. del" contains the two figures, of which reduced copies are here given :—

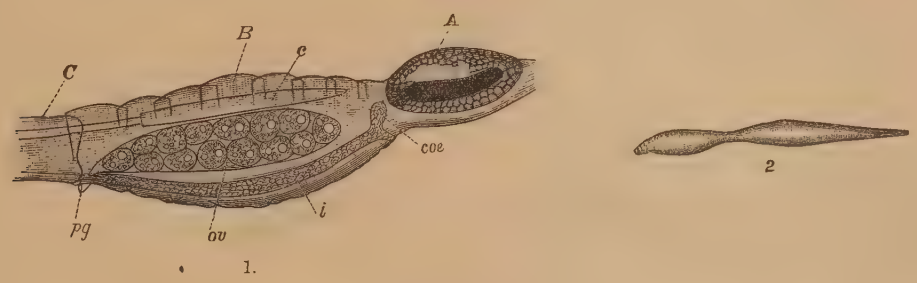

Fig. 29.

The accompanying explanation is :—

"Fig. 1. Thorax des ♀.
A Kopf.
B Thorax.
C Abdomen.
c Herz.
coe Cœcum.
i Darm.
pg papilla genitalis.
Fig. 2. Hoden des ♂."

It will be observed that the papilla genitalis of the female is placed in the seventh segment of the peræon instead of in the fifth as might be expected, but this is probably an error. The figures do not suffice to determine what species of *Oxycephalus* was under examination; apart from their scientific value, they have a special interest as being the work of the young and ardent naturalist who closed his life on board the Challenger, during the voyage to which he had looked forward with so much eager enthusiasm.

Another plate by von Willemoes Suhm contains the following figures :—

Fig. 30.

The account accompanying these figures is as follows :—

"Oxycephalus oceanus Guérin, 12–20 Febr. 75. Western Pacific, Nordküste von Neu-Guinea.

a' erste
a'' zweite } Antenne.
mp. palpus mandibul.
g' erster Gnathopod.

Fig. 1. Kopf eines alten ♂ aus der melanesischen See.
Fig. 1*a*. Erste Antenne H. [Hartnack] 1/7.
Fig. 2. Kopf eines *alten* ♀.
Fig. 2*a*. Erste Antenne desselben H. 1/7.
Fig. 3. Kopf eines jungen ♀, das aber schon geschechtsreif. Zweite Antenne hat sich noch nicht zusammengelegt."

It is clear that all three figures are taken from male specimens, and from the nature of the case the name given them could only have been conjectural.

Oxycephalus porcellus, Claus (Pl. CCIII.). Specimen A.

1879. *Oxycephalus porcellus*, Claus, Die Gattungen und Arten der Platysceliden, p. 48.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 36.
1887. „ „ Claus, Die Platysceliden, p. 72, Taf. xxiv. figs. 7–9.

Head rather longer than the peræon, thick at the base; the rostrum much less acute when seen from above than appears from a lateral view, shorter than the ocular region, the edges smooth; the first three segments of the pleon with the postero-lateral angles acute, a little produced; the fourth pleon-segment dorsally as long as the following composite segment measured to the base of the third uropods; the composite segment ventrally produced to the rami of the third uropods.

Eyes occupying the sides of the head to the base of the rostrum.

Upper Antennæ.—Peduncle short, the first joint not longer than broad, the second incompletely developed; first joint of flagellum long, curved, with a broad brush of filaments, the upper margin slightly concave, with the apex rather strongly but not extravagantly produced upwards; the small second joint a little longer and broader than the third, each with a small apical group of filaments; the fourth joint linear, a little longer than either of the preceding, tipped with setules.

Lower Antennæ.—Third (first free) joint of the peduncle very long, curved, distally dilated; fourth joint longer than the third; fifth a little longer than the fourth; first joint of the flagellum slender, fully as long as the third joint of the peduncle; terminal joint minute; the three joints of the peduncle and the first of the flagellum all closely fringed with short filaments, and the terminal joint tipped with them.

The Epistome appears to be helmet-shaped, with an *Upper Lip* of great tenuity, transversely oval, but a little excavate on the lower margin.

Mandibles.—Trunk very short compared with the palp; cutting edge with a produced tooth at the top, the rest of its margin straight, finely denticulate, the left mandible having a shallow secondary plate, with its edge nearly as long as that of the principal, the right mandible having a minute tubercle to the rear of the cutting plate; the first joint of the palp between three and four times as long as the two following joints together; the second joint a little longer than the third, the two together forming a hook, both much narrower than the first joint.

Maxillipeds small, the inner plate widening distally, with the usual embedded spinules at the centre of the front margin, the outer plates broad, with their broad apices almost meeting over the inner plate.

First Gnathopods.—The side-plates with the lower front angle produced forwards, almost acute, having a ridge on the under surface running to the apex. The first joint a little widened below the neck; the second joint scarcely so long as broad; the third distally widened, broader than long, with a subapical spine on the convex hind margin;

the wrist very broad, the greatest breadth a little less than the length; the produced part much broader than long, distally denticulate with eleven teeth, of which the central one is the longest, forming a kind of apex; the hinder margin is very faintly serrate and pectinate, and there are numerous spines of various sizes upon the inner surface, chiefly on or near the produced part, some of them being shown in the figure *gn.*[1] as seen through the partially transparent joint; the hand not nearly half as broad as the wrist, the length not equalling the wrist's greatest breadth; there are three spines on the lower part of the very convex front margin; the hind margin slightly concave or nearly straight, having a low serration alternating with sharp and distinct but little teeth, the adjacent inner surface set with numerous spines, and the apex produced nearly halfway along the finger; the finger slender, curved, more than half the length of the hand.

Second Gnathopods.—The side-plates convex in front. The wrist much larger than in the first pair, the hind margin much longer than the front, forming an acute apex, the distal margin oblique, very long, finely and regularly denticulate, the hind margin and inner surface carrying several slender spines; the hand longer than in the first gnathopods, scarcely so broad, its length not equalling the breadth of the wrist, having numerous spines on the inner surface; it is bent at the neck, below this the hind margin being slightly convex, denticulate, the apex not projecting much behind the finger; the finger slender, curved, acute, considerably more than half the length of the hand, having a little tooth on the inner margin.

First Peræopods.—First joint with narrow neck, the front margin concave; the second joint longer than broad; the third about as long as the fourth but broader, with a few small spines on the hind margin, which except near the base is straight; the fourth shorter but much broader than the slender fifth; the finger more than half the length of the preceding joint.

Second Peræopods like the first, but the fifth and perhaps one or two other joints longer; the finger not half the length of the preceding joint.

Third Peræopods.—The side-plates having a very narrow backward-directed process on the inner side. First joint about twice as long as the greatest width, which is a little above the centre, the front margin nearly straight, the hinder very convex; the second joint bent; the third rather longer than the fourth, each with slender spines along the front margin; the fifth joint slender, slightly curved, much longer than the third joint, the concave front margin fringed with a few spinules and minutely furred; the finger slender, rather more than a fourth of the length of the fifth joint.

Fourth Peræopods.—First joint not longer but much broader than in the preceding pair, with very convex hind margin; the third joint longer than the fourth, strongly pectinate along the front margin, which is produced into a little apical lobe also pectinate and carrying a little spine; the fourth joint longer than the fifth, pectinate along the front margin, having a little spine not far from the apex which with the under surface of

the distal margin is more finely pectinate than the upper part of the joint; the fifth joint decurrently pectinate with teeth of various sizes along the front margin and with slender close-set teeth round the apex; the finger straight, acute, half the length of the preceding joint.

Fifth Peræopods.—First joint shorter than in the third peræopods but not less broad, longer than the following joints together, the hind margin irregularly convex; the second joint as broad as the third, not longer than broad; the third a little longer than the fourth; the fourth rather longer than the fifth, slender, tapering; the finger minute, straight.

Pleopods.—The coupling spines very small, the arms of the cleft spine short, and the subapical dilatation small; the joints of the rami about twelve in number.

Uropods.—Peduncles of the first pair rather longer than the rami, three-sided; the rami long, equal, three-sided, pectinate on two edges, reaching nearly to the apex of the telson; peduncles of the second pair much shorter than those of the first, shorter than the rami; the rami broadly lanceolate, the outer a little shorter than the inner, which is as long as those of the first pair, the edges pectinate below; the peduncles of the third pair little longer than broad, shorter than the rami; the outer ramus a little shorter and much narrower than the inner, the edges pectinate, more loosely on the outer than on the inner margin.

Telson triangular, much longer than broad, if reckoned from the base of the third uropods, the apex acute; the telson forms a shield under which the rami of the third uropods are neatly packed away, the rami in this position covering its whole under surface except the narrowed apex and a small triangular space at the base.

Length, a little over half an inch.

Locality.—South Pacific, between Api and Cape York; surface. One specimen, male.

Remarks.—Claus' specimen from Zanzibar was a female not fully adult, 8 mm. in length, and differing from the Challenger specimen in not having the hind margin of the hand of the first gnathopods produced along the finger, and in having the fifth peræopods relatively much smaller, but in other respects the two specimens are so closely alike that it seems undesirable to separate them specifically. It is possible that this species may be the same as Guerin's *Oxycephalus oceanicus*, or that species may be the same as Claus' *Oxycephalus similis*, but it is not possible, I think, to determine such questions.

Oxycephalus porcellus (Pl. CCIV., A). Specimen B.

Head as long as the peræon, rostrum acute, nearly as long as the ocular region of the head, its margins sparsely and shallowly serrate; the coalesced fifth and sixth segments of the pleon not so long as the telson, but broader.

Upper Antennæ.—First joint of peduncle not very broad, second short; first joint

of flagellum longer than the peduncle, tapering, carrying some groups of filaments, the two following joints slender, small.

Lower Antennæ not fully developed.

Mandibles.—The palp small, almost straight, the jointing not fully developed.

First Gnathopods.—The side-plates with the lower front corner produced, rounded. The first joint reaching considerably below the side-plate; the third joint broader than long, with a slender spine at the apex of the convex hind margin; the wrist broad, with numerous spines on the inner surface, the hind margin very finely pectinate, the distal process broad, not very long, with three graduated teeth on each side of the long central one which is the longest and most produced; the hand in close agreement with that described for *Oxycephalus porcellus*, Claus, from the Pacific.

Second Gnathopods showing only such points of difference from those of the specimen just mentioned as might be expected in a younger specimen, the wrist having fewer spines, being less broad, with fewer teeth on the inner or front margin of the wrist's process; the denticulation of the almost straight hind margin of the hand is very similar without being absolutely alike in the two specimens.

First Peræopods.—Third joint shorter than fourth; fourth shorter but much wider than fifth. The peræopods in general as in the other specimen, but with fewer spinules, the finger in the third pair more than a third the length of the preceding joint, and in the fourth pair more than half.

Pleopods.—Cleft spine having an unsymmetrical subapical dilatation to the longer arm; eight joints to each ramus.

Uropods.—Peduncles of the first pair scarcely as long as the rami, which are subequal, with serrate margins, the inner slightly the longer, reaching as far back as the outer ramus of the third pair; peduncles of the second pair much shorter than those of the first, shorter than the rami; the rami rather shorter than those of the first pair, the outer narrower and a little shorter than the inner, the edges for the most part pectinate; peduncles of the third pair longer than broad, shorter than the rami; the outer ramus a little shorter and much narrower than the inner.

Telson more than twice as long as broad, the greatest breadth some distance below the base, the sides being convex at first, finally converging to a very acute apex that reaches beyond the uropods.

Length, at full stretch, about three-tenths of an inch.

Locality.—Station 106, August 25, 1873; Equatorial Atlantic; lat. 1° 47′ N., long. 24° 26′ W.; surface to 40 fathoms; surface temperature, 78°·8. One specimen, young male.

Remarks.—The narrower base of the telson and the narrower wrist of the second gnathopods as well as the smaller number of teeth in the wrist process of the first

gnathopods, may prove to be characters sufficiently constant to warrant the establishment of a distinct species, but in the meantime, as the specimen is not adult, the separation of it from the older species may await further information.

Oxycephalus longiceps, Claus (Pl. CCIV., B).

1879. *Oxycephalus longiceps*, Claus, Die Gattungen und Arten der Platysceliden, p. 48.
1887. „ „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 37.
1887. „ „ Claus, Die Platysceliden, p. 72, Taf. xxiv. fig. 10.

Head considerably longer than the peræon, not showing any constriction at the neck while in position, the rostrum acute, not very much shorter than the ocular region, the edges smooth; the coalesced fifth and sixth segments of the pleon about as long as the telson and scarcely broader, the postero-lateral angles of the first three pleon-segments acute, not much produced.

Upper Antennæ attached a little in advance of the eyes, straight in the specimen; the first joint of the peduncle more than twice as long as the second; the first joint of the flagellum a little longer than the first of the peduncle, narrowing distally, with a few apical and subapical filaments, the second joint not half the length nor nearly half the breadth of the first, the third as long but only half as broad as the second.

Lower Antennæ (of the young male), the three free joints of the peduncle subequal, short, smooth, comparatively thick, closely folded, indistinctly jointed; the flagellum of one joint, tapering, not acute, nearly as thick as the peduncle, but shorter than any of its joints.

Mandibles.—The palp not as yet distinctly jointed.

First Gnathopods.—Side-plates with the lower front angle acute, not produced. The first joint reaching a little below the side-plate; the second joint broader than long, with one subapical spinule on the convex hind margin; the third joint little longer than the second, distally widened, with three spinules on the convex hind margin; the wrist much longer and broader than the hand, with numerous spines on the inner surface and along the minutely pectinate hind margin, which is apically only a little outdrawn but into a very acute point; the hand with numerous spines on the inner surface, the front margin very convex, the hinder nearly straight and smooth, with a little apical tooth; the finger short, very acute.

Second Gnathopods.—Side-plates with the lower front angle acute and a little outdrawn. The branchial vesicles simple. The third joint considerably longer than the second, with one spinule at the apex of the hind margin; the wrist much more widened than in the first pair, with few spines on the inner surface and hind margin, the latter apically outdrawn almost to the end of the hand, the process at first broadly triangular,

but the apex linear, spine-like; the hand longer than in the first pair, longer than the front margin of the wrist, with eight or nine spines on the inner surface, and three or four little spinules adjacent to the hind margin which is smooth and nearly straight; there is here no toothed apex or palmar margin. The finger curved, acute, not half the length of the hand, having above the centre a little spinule on the inner margin.

First Peræopods.—First joint slender, curved; second joint longer than broad, with one spinule on the hind margin; third longer than fourth, which is only a little wider than the fifth and scarcely shorter; the finger about a third of the length of the fifth joint; the third joint has two slender spines on the hind margin, the fourth four, the fifth two.

Second Peræopods like the first, but with the fifth joint longer, the finger only a fourth of the length of the preceding joint.

Third Peræopods considerably the longest; the side-plates with a tongue-shaped process on the inner surface; the branchial vesicles with a constriction near the narrowed apex; the first joint not greatly widened, widest at the centre, the hind margin convex, the front almost straight; the second joint short, with rounded front apex; the third considerably longer than the fourth and a little longer than the fifth; the finger about a quarter as long as the fifth joint, slender like the three preceding joints.

Fourth Peræopods.—First joint as long as in the preceding pair, at the upper part considerably wider, the hinder apex rounded, produced behind the short second joint; the third joint considerably longer than the fourth or fifth, with the front margin and apex strongly pectinate; the fourth joint shorter than the fifth, both pectinate along the front, but much more delicately than the third joint; the finger nearly straight, very acute, more than a third of the length of the fifth joint.

Fifth Peræopods.—Side-plates with rounded angles, partly distinct from the segment. The limb longer, if outstretched, than the first joint of the preceding pair; the first joint not very widely expanded, longer than the remaining joints together; of these the third is the longest; the finger minute, spine-like.

Pleopods.—The cleft spine with short arms, that with the subapical dilatation the longer; the joints of the rami six in number.

Uropods.—Peduncles of the first pair reaching to the base of the telson, rather longer than the rami; the slightly longer inner ramus reaches as far back as the apex of the outer ramus of the third pair; the edges of all the rami are pectinate with long decurrent teeth; the peduncles of the second pair are longer than the outer, shorter than the inner, ramus; the inner ramus is subequal to those of the first pair; peduncles of the third pair much longer than broad, shorter than the rami, the inner margin having a little apical tooth; the outer ramus is shorter and narrower than the inner.

Telson fully twice as long as the breadth at the base, triangular, with gently convex sides, the produced and sharply pointed apex reaching a little beyond the uropods.

Length, fully extended, two-fifths of an inch.

Locality.—July 4, 1875, North Pacific; lat. 36° 42′ N., long. 179° 50′ W.; surface, night; surface temperature, 69°·2. One specimen, young male.

Remarks.—Claus' specimen from Zanzibar was a young male, only 6 mm. in length; the representation of the first gnathopods in Claus' figure is not suitable to those of the Challenger specimen, but, as they are not separately figured, I have not allowed this difference to outweigh the general agreement between the two forms.

Genus *Leptocotis*, Streets, 1877.

1871. *Oxycephalus* (*pars*), Claus, Unters. über den Bau und die Verwandschaft der Hyperiden, Nachrichten K. Gött. Soc., p. 155.
1877. *Leptocotis*, Streets, Bulletin U.S. Nat. Mus., No. 7, p. 136.
1878. „ Streets, Proc. Acad. Nat. Sci. Philad., p. 283.
1879. *Oxycephalus* (*pars*), Claus, Die Gattungen und Arten der Platysceliden, p. 48.
1887. *Leptocotis*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 38.
1877. *Oxycephalus* (*pars*), Claus, Die Platysceliden, p. 71.

For the original definition of the genus, see Note on Streets, 1877 (p. 470). In the definition given the following year Dr. Streets omits the statement that the constricted portion of the head is "not narrower than the thorax," and applies the term "thoracic legs" to the gnathopods and peræopods in common, instead of to the peræopods alone as in the earlier definition. The first species clearly known of this genus is Claus' *Oxycephalus tenuirostris*, which Claus retains under *Oxycephalus*, making *Leptocotis spinifera*, Streets, a synonym of it. The differences, indeed, between *Oxycephalus* and *Leptocotis* as defined by Dr. Streets resolve themselves almost entirely into the comparative stoutness of the former and slenderness of the latter genus. Of *Oxycephalus* Dr. Streets says, "body moderately long, robust; head narrow, produced anteriorly in a broad, triangular rostrum, short, grooved below;" "the last three pairs [of *Peræopods*] with the basal joint broadly dilated;" "the sixth abdominal segment broad, not elongated; the caudal appendages short, broadly lanceolate; telson broadly triangular." For *Leptocotis* he says, "body long and slender; head produced anteriorly to the superior antennæ in a long, slender rostrum;" "the last three pairs [of *Peræopods*] with the basal joint dilated;" "the sixth abdominal segment (the fifth and sixth fused) elongated; the caudal appendages long, linear; telson long, triangular at apex." In regard to *Oxycephalus* he also says, "extremity of the sixth pair [*Fourth Peræopods*]—articulating with the broad basal joint—finely serrated along the anterior margin," but this equally applies to *Leptocotis*. Of *Leptocotis* he says that the upper antennæ are "curved in the male," but this also applies to

Oxycephalus. He does not mention the extreme development of the upturned apex of the first joint of the flagellum in the male upper antennæ of *Leptocotis*, except in the description of the type-species; nor would the character be of much use, since it probably only belongs to a limited portion of the animal's life.

Leptocotis ambobus, n. sp. (Pl. CCV.).

Head as long as peræon with the first two segments of the pleon, the neck depressed, more than half the total length of the head in front of the eyes, the rostral tract in front of the upper antennæ narrow and slightly arched, rather more than a third of the total length of the head; the first three segments of the pleon with the lower margins finely serrate, the postero-lateral angles of the first two segments not outdrawn, but those of the third segment much outdrawn and acute, those of the fourth segment acute, but only little outdrawn; the double segment elongate, with sharp lateral edges and two dorsal ridges traversing its whole length.

Eyes not nearly reaching the point at which the upper antennæ are inserted, the front ocelli the smallest, the ocular pigment long, but the principal point from which the ocelli appear to radiate situated low down and much behind the centre of the eye.

Upper Antennæ attached considerably in advance of the eyes, at about a fourth of the whole distance between these and the apex of the rostrum; the first joint of the peduncle much longer than broad, the second short and imperfectly developed; the first joint of the flagellum very much longer than the peduncle, the convex side carrying a thick brush of filaments, the apex upturned at a right angle with the main portion of the joint, forming a prominent, tapering process with a few filaments on the almost straight outer margin; the three following joints are very small and narrow, lying back against the first joint, in line with the apical process, but pointing in the opposite direction.

Lower Antennæ.—The third (first free) joint of the peduncle elongate, curved near the base, distally thickened, fringed with short filaments; the fourth joint a little but decidedly longer than the third, more slender, with each end a very little thickened; the fifth joint of about the same length as the fourth; the first joint of the flagellum very slender, nearly as long as the third joint of the peduncle; the second joint minute, with the fringing filaments only at two points.

Epistome apparently almost semicircular in outline, but bent so that the two divisions of the front surface produce an angular projection down the centre.

Mandibles.—The trunk very short compared with the length of the palp; the secondary plate on the left mandible similar to the principal, but smaller; the first joint of the palp slender, a little shorter than the first joint of the flagellum of the

lower antennæ, more than three times as long as the two following joints together, which are subequal to one another, and curved so as in combination to be sickle-shaped.

Maxillipeds.—The inner plate short and broad, with the usual pair of embedded spinules at the centre of the distal margin, the outer plates apically narrowed. Between the mandibles and maxillipeds there is a space which is certainly not empty, and may be presumed to contain the other mouth-organs though in a more or less rudimentary condition.

First Gnathopods.—The side-plates with the lower front corner produced forwards, well rounded. The first joint scarcely or not reaching below the side-plates, widened at the centre for the gland-cells; the second joint broader than long; the third joint longer than the second, but small, with a spinule at the apex of the hind margin; the wrist large, widening to the attachment with the hand, the hinder process broadly triangular, with a spine-like apex, both margins of the process being finely denticulate, the hind margin of the wrist carrying in all about a dozen denticles and the inner margin half a dozen; the hand narrow at the neck, with very convex front margin, the hind margin nearly straight and when the hand is closed upon the wrist not reaching the tip of its spine-like apex; the hand is broader distally than at the neck, the little palm being cut into two denticles; the finger is very small and slender, yet more than half the length of the hand, reaching a little beyond the palm, and having a small denticle on the inner margin; there are spinules on the surface of both hand and wrist, but they are not very conspicuous.

Second Gnathopods longer than the first; the side-plates widened below. The first joint longer and more slender than in the first pair; the wrist also longer and with the process more outdrawn so as to make the limb complexly chelate rather than subchelate, the denticles on the hind margin not so closely set; the hand longer than in the first pair, with the palm margin cut into three or four denticles; the finger not more than half the length of the hand.

First Peræopods with all the joints slender, the third a little longer than the fifth and both considerably longer than the fourth. The gland-cells conspicuous in the first and third joints.

Second Peræopods like the first, but with longer joints, and the fifth longer than the third.

Third Peræopods.—The hind lobe of the side-plates deeper than the front and deepest just behind the attachment of the first joint, the inner process being almost linear. The first joint longer than the three following together, widest a little below the base, the front margin nearly straight, the convexity of the hind margin little developed except above; the third joint much longer than the fourth, about equal in length to the much narrower and slightly curved fifth; the front margin of the third

and two following joints faintly furred; the slender, slightly curved, and very acute finger more than a third the length of the fifth joint.

Fourth Peræopods.—The first joint broader than in the preceding pair and nearly as long, with some convexity of the front as well as of the hind margin, which is produced beyond it both above and below; the third joint elongate, as long as the remaining three together, pectinate with retroverted teeth along the front margin and its slightly produced apex; the fourth joint shorter than the fifth, both pectinate; the finger short, straight, acute.

Fifth Peræopods.—The side-plates with the hinder angle a little produced, rounded. The first joint about two-fifths as long as the first of the third peræopods, as broad as the length, about one and a half times as long as the feeble remaining joints together; the second joint with very convex front margin; the third joint also with convex front; the fourth much narrower but only a little shorter than the third; the fifth a little longer than the third; the finger minute, sharp-pointed.

Pleopods.—Coupling spines slender in the shaft, with the usual denticulate caps; the cleft spine with unsymmetrical subapical dilatation of the longer arm; the joints of the rami eight or nine in number.

Uropods.—Peduncles of the first pair subequal in length to the double segment, three-edged, the inner margin more closely denticulate than the outer, nearly two and a half times as long as the long outer ramus, which is also three-edged, denticulate, and finely pectinate; the inner ramus only about a quarter the length of the outer; the peduncles of the second pair very similar to those of the first and not much shorter, rather more than twice as long as the inner ramus; the outer ramus about three-quarters the length of the inner, both of them denticulate and pectinate; the peduncles of the third pair longer than broad, coalesced with the inner ramus, the inner margin of which is much more strongly denticulate and pectinate than the outer; the outer ramus is less than half the length or breadth of the inner, with pectinate teeth on the inner margin, the outer margin smooth.

Telson coalesced with the preceding double segment of which it is less than half the length, its breadth at the base about a third of the length, the apex very acute and outdrawn considerably beyond the uropods.

Length of the outstretched animal eleven-twentieths of an inch.

Locality.—Station 287, October 19, 1875; South Pacific; lat. 36° 32′ S., long. 132° 52′ W.; surface; surface temperature, 57°·8. One specimen, male.

Remarks.—This species comes exceedingly near to *Leptocotis* (*Oxycephalus*) *tenuirostris*, Claus, and to *Leptocotis lindströmi*, Bovallius, hence the specific name. Claus says that in his species the postero-lateral angles (die Seitenflügel) of the pleon-segments are unarmed, yet he figures that of the third segment sharply pointed, as

it is in the present species, and as Streets states it to be in his *Leptocotis spinifera*, since regarded as a synonym of Claus' species. Streets also says that the inferior margins of the first three segments of the pleon are finely serrated, and they are so in the present species. Claus says that the coalesced fifth and sixth segments are three to four times as long as the telson, here they are little more than twice as long; the peduncles of the first and second uropods, he says, are four to five times as long as the rami, while here they are only a little more than twice as long. Of the diminutive inner ramus to the first, and diminutive outer ramus to the third, uropods, neither Claus nor Streets make any mention. The character of the afterpart of the pleon brings the species near to Bovallius' species, but in that the second gnathopods as well as the first are said to be subcheliform, whereas in our species the second pair deserve to be called chelate; again Bovallius states that the fifth peræopods are in his species a little shorter than the first joint of the fourth pair, a description which would not naturally be applied to the very short fifth peræopods of the present species, in which the first joint is as broad as long, considerably less than half as long as that of the preceding pair, but much longer than the upturned remaining joints. Streets says in the description of *Leptocotis spinifera*, "the last pair of legs diminutive, not half as long as the basal joint of the preceding," but he is perhaps only taking into account the first joint, not considering what the total length of the limb would be with the remaining joints outstretched.

Claus' species was taken in the Gilolo-Passage; Streets' specimen in the "North Pacific Ocean. Latitude 29° north; longitude 157° west;" Bovallius' species was taken in "tropical parts of Atlantic." It is possible that, notwithstanding some differences in the specimens and descriptions, *Leptocotis tenuirostris*, *Leptocotis spinifera*, *Leptocotis lindströmi*, and *Leptocotis ambobus* may be the synonyms of a single species, but this must be left for future research to decide.

A plate with the signature "R. v. W. del" contained the figures here reproduced on a smaller scale:—

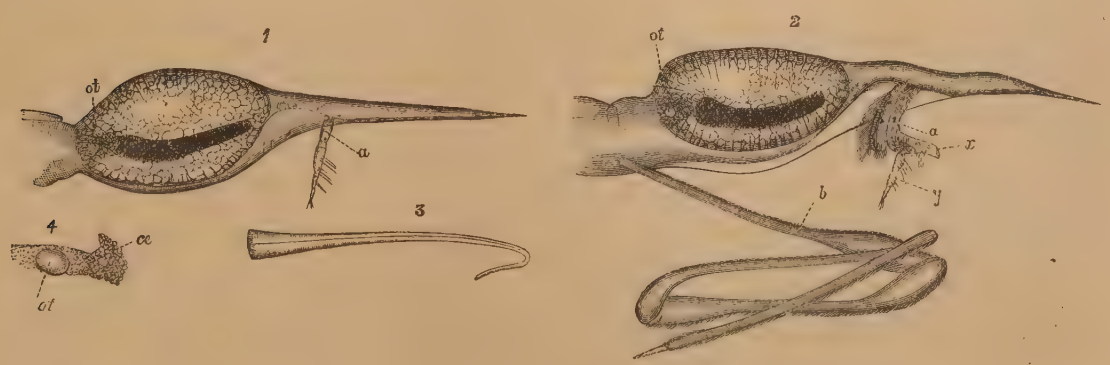

Fig. 31.

The following account accompanied the drawings :—

"Amphipoden No. 1*a*.
Tenerife—St. Thomas.
Lat. 21° 38′ N.
Long. 44° 39′ W.
Temp. d. Oberfl. 22·2 C.
4 März 73.

Cf. Oxycephalus piscator, M. Edw.
(Fam. Typhidæ. Trib. Hyperinæ).
Hartnack 1/4.
Fig. 1. Kopf des ♀.
a. vordere Antennen
ot. Otolith.
Fig. 2. Kopf des ♂.
a. vordere Antenne;
x. Schaft
y. Glieder der A.
b. hintere 4gliedr. Ant.
Hartnack 1/7;
Fig. 3. Kristallstäbchen.
Fig. 4. Der dem Gehirnganglion (*ce*) aufliegende Otolith (*ot*) mit seinem Nerven."

It may be presumed that at least fig. 2 belongs to the genus *Leptocotis*, but to which of the specific names it should be assigned cannot be decided from the figure of the head alone. That which v. Willemoes Suhm designates as the shaft or peduncle of the upper antennæ includes what is here considered to be the first joint of the flagellum, the letter *x* in the figure being at the almost monstrously upward-produced apex of that joint.

Leptocotis mindanaonis, n. sp. (Pl. CCIV., C).

Head as long as the peræon and first four segments of the pleon, the neck narrow, ocular region dilated, rostrum curved, acute, narrowly elongate, yet not nearly so long as the remainder of the head, with a line of orange spots along each side, its margins a little serrate near the eyes, smooth near the apex; the third segment of the pleon with the postero-lateral angles acutely produced, the first and second having these angles squared; the coalesced fifth and sixth segments considerably longer but very little wider than the telson.

Upper Antennæ.—The first joint of the flagellum considerably longer than the small two-jointed peduncle, its upper margin carrying four sets of filaments; the two terminal joints minute.

The Gnathopods nearly as in *Oxycephalus longiceps*, Claus, but with the wrist in the second pair less dilated, longer in proportion to the breadth, and the spine-like apex of the process not nearly reaching the apex of the hand.

First and Second Peræopods with slender joints.

Third Peræopods.—The side-plates with a short and narrow inner process, not of uniform breadth. The branchial vesicles with a constriction near the narrowed apex. The first joint slenderly pear-shaped, the greatest width being near the base; the third

joint longer than the fifth; the fifth than the fourth; the finger straight, about a fifth of the length of the preceding joint.

Fourth Peræopods.—The third joint as long as the fourth and fifth together, all three pectinate along the front margin, the third having large teeth alternating with sets of three or sometimes two or four minute ones, at the slightly produced apex having only little ones.

Fifth Peræopods.—The rounded end of the side-plate is separated from the segment by an open notch. The first joint is as broad and as long as in the preceding pair, as long as all the remaining joints together; the third is slender, straight, longer than the fourth; the fourth about equal to the fifth; the finger straight, very minute.

Pleopods.—The peduncles not very stout; in the cleft spine the subapical dilatation is unsymmetrical, the arm that carries it reaching a little beyond the other; the joints of the rami six in number, the first joint long.

Uropods.—Peduncles of the first and second pairs elongate, longer than the rami, reaching back nearly on a level; the rami having the margins pectinate with long decurrent teeth; the rami of the first pair equal, in the second pair the outer ramus a little shorter than the inner, the latter reaching a little beyond the rami of the first pair, but not so far as either apex of the third pair; peduncles of the third pair a little shorter than the rami, about a third as long as the peduncles of the first pair; the outer ramus shorter than the inner, the edges of both pectinate like those of the other pairs.

Telson three times as long as broad, with a very acute apex reaching beyond the uropods. The telson and uropods are slightly spotted with orange.

Length, about two-fifths of an inch.

Locality.—Off Mindanao, Philippines, surface.

Remarks.—The specific name is taken from the locality. From *Oxycephalus longiceps*, Claus, it is well distinguished by the narrow neck, the more prolonged double-segment of the pleon, the much longer peduncles of the second uropods, besides the minuter details connected with the gnathopods and peræopods.

Genus *Calamorhynchus*, Streets, 1878.

1878. *Calamorhynchus*, Streets, Proc. Acad. Nat. Sci. Philad., p. 285.
1887. „ Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 39.

For the original definition of the genus, see Note on Streets, 1878 (p. 485). The character there given, "superior antennæ with the peduncle three-jointed; in the female straight," does not entirely suit the Challenger species, in which these antennæ are curved or sinuous; that which the definition regards as the third joint of the peduncle

is in this Report considered to be the first of the flagellum. The expression "first and second pairs of thoracic legs" refers to the gnathopods; by "the sixth segment of the abdomen" is meant the double-segment composed of the fifth and sixth segments of the pleon coalesced. The character, "telson short, triangular," is rather vague, since those epithets, however applicable to the type of the genus, do not convey the idea of a telson about four times as long as its greatest breadth, which are its dimensions in the Challenger species.

Calamorhynchus rigidus, n. sp. (Pl. CCVI.).

There appears to be a very close similarity between this remarkable species and the type of the genus, *Calamorhynchus pellucidus*, Streets. The description of the head given by Dr. Streets is almost exactly applicable to the present species, "head long, nearly one-third of the total length, its breadth twice that of the thorax [peræon]; the portion containing the eyes oblong, convex above and below when viewed in profile, elevated above, in the median line, into a sharp ridge, which terminates at the apex of the rostrum; below the eyes form two long and rounded lobes separated by a broad, shallow groove; rostrum flattened, posteriorly broader than the eyes, commencing on either side of the eyes in a broad, rounded wing-like expansion, and tapering forward to a long and acute apex." The whole animal is sharply angled along the median dorsal line. The middle segments of the peræon rather longer than those at the two extremities; the whole length of the peræon subequal to that of the first three segments of the pleon together; the third segment of the pleon has the postero-lateral angles very acutely produced, the second segment has them produced in a less degree than the third, and the first than the second; the fourth segment is much shorter than either of the three preceding, and little more than a third of the length of the coalesced fifth and sixth segments.

Upper Antennæ slender, first joint of the peduncle much longer than the second, which is not longer than broad; the first joint of the flagellum is in the present species twice as long as the first of the peduncle (not, as in the type-species, subequal to it), somewhat curved, with filaments at seven or eight points along the convex margin and a couple at the apex of the opposite margin; the second joint very much thinner than the preceding, shorter than the first joint of the peduncle, with apical filaments; the third joint about half the length and breadth of the second, with apical setules.

Lower Antennæ wanting in the female.

Upper Lip.—The upper margin not evenly convex but with a little lobe in the centre.

Mandibles.—The cutting edge very oblique, finely striate and denticulate, having a narrow, slightly produced tooth at the upper corner; the secondary plate of the left

mandible similar to the principal, but without the produced tooth; the little process behind the cutting plate on the right mandible extremely minute; palp wanting in the female.

Lower Lip and *Maxillæ* appear to be represented but they are difficult to determine.

Maxillipeds strongly bent.

First Gnathopods.—The first joint little longer than the wrist and not half as broad; the second joint broader than long; the third widening distally, rather longer than broad, with a spine at the apex of the hind margin; the wrist very large, broadest at the base of the hand, longer than broad, the hind margin longer than the front, carrying a few small spines, the broad process not so long as the proximal part of the wrist, nor reaching quite to the extremity of the hand, its front or inner margin cut into several teeth and bordered on each surface with a thick brush of spines, the apical tooth much the longest, the short hind margin of the process having one tooth between the long apical tooth and the short tooth which forms the apex of the hind margin proper; the hand is shorter than the front margin of the wrist, with numerous spines on both surfaces, most numerous distally and near the hind margin; the hind margin nearly straight, toothed and serrate, the apical tooth the largest, produced some way along the finger; the finger slender, a little curved, scarcely half as long as the hand, having a small tooth at about the centre of the hind margin.

Second Gnathopods.—The first three joints nearly as in the first pair, the wrist of similar type but with the proximal part much more elongate, the hind margin continuous to the long apical tooth, and the inner margin of the process cut into about fifteen teeth which are larger and much closer together than those in the first pair, with comparatively few spines on the adjacent surface; the hand reaches a little beyond the process of the wrist, but is very much shorter than the front margin; it has spines as in the first pair, and the hind margin is cut into a dozen close-set decurrent teeth, resembling those of the wrist; the finger is slender, bent, more than half the length of the hand, having a tooth near the centre of the hind margin.

First, Second, Third, and Fourth Peræopods.—There are numerous spinules along the hind margin of the third, fourth, and fifth joints in the first and second pairs; the second pair are the longer; the third pair are longer than the second, and have the same joints furnished along the front with spinules; the shorter fourth pair have the third joint pectinate with short straight teeth, the fourth with longer straight teeth, the fifth with unequal decurrent teeth, the finger finely pectinate. The side-plates of the third pair have on the inner side a narrow tongue-like process pointing directly backwards.

Fifth Peræopods.—Side-plates with rounded front angle, only the hinder half disjoined from the segment, this half shallow, with the upper and lower margins nearly straight and parallel. The first joint slender, pear-shaped, somewhat longer than the first in the preceding pairs and rather longer than the remaining joints together, apically

much narrowed; the second joint short, the third very slender, considerably longer than the fourth, and the fourth than the almost linear yet tapering fifth; the finger minute, rather like the nib of a pen. This limb, instead of being, as in the type-species, "diminutive, barely exceeding the basal joint of the preceding pair," is nearly as long as the whole limb in that pair.

Pleopods.—Peduncles narrow, elongate; coupling spines small; cleft spine as in *Streetsia challengeri;* rami having about a dozen joints apiece; the interlocking process on the first joint of the outer ramus not sinuous.

Uropods.—Peduncles of the first pair prismatic in transverse section, elongate but not reaching the end of the double segment, more than twice as long as the outer, not twice as long as the inner, ramus, the inner margin denticulate, the rounded apex of the outer finely pectinate; the rami prismatic, denticulate on both margins, more strongly on the inner; peduncles of the second pair as broad as but a little shorter than those of the first and not reaching quite so far back, more than twice as long as the rami, the inner margin slightly serrate and distally forming with the apical margin a small produced triangle; the rami similar to those of the first pair but respectively shorter; the peduncles of the third pair longer than the outer ramus, nearly as long as the inner, with which the peduncle is coalesced; the outer ramus denticulate only on the inner margin, the inner on both margins, the denticulation of the inner margin being continued some way up the peduncle. In the type species the first uropods are described as "stouter than the second, equal in length."

Telson between three and four times as long as broad, produced to a sharp apex some way beyond the uropods; the length more than three-fifths of that of the coalesced fifth and sixth segments, equal to that of the first segment of the pleon; there are some very minute submarginal setules, and a little faint serration is visible near the middle of the lateral margins.

Length, nine-tenths of an inch.

Locality.—Station 330, March 8, 1876; South Atlantic; lat. 37° 45′ S., long. 33° 0′ W.; surface; surface temperature, 64°·2. One specimen, female, with young in the pouch.

Remarks.—The specific name refers to the rigid straightness of the specimen as preserved. A specimen, one-third of an inch long, probably belonging to this species, was taken in Simon's Bay, Cape of Good Hope, November 10, 1873. The type species of the genus was obtained in the Pacific, "lat. 28° 06′ N., long. 140° 12′ W.," Dr. Streets' specimen being also a female. The remarkable differences between the adult, with its pointed head and tail, and the young first taken from the pouch, with both ends blunt, may be seen from the figures.

Genus *Streetsia*, n. gen.

Head not constricted at the base, much longer than the peræon, the rostrum very elongate and the eyes still more so.

The Gnathopods complexly subchelate.

The Second Peræopods longer than the *First*.

The Fourth Peræopods with the hinder apex of the first joint acutely produced.

The Fifth Peræopods with dilated first joint exceeding in length the other five joints together; the outstretched limb exceeding in length the first joint of the fourth pair.

The Uropods with the rami distinct from the peduncles; the *Third Uropods* with peduncles much longer than broad.

The Telson produced far beyond the uropods, much longer than the coalesced fifth and sixth segments of the pleon.

The generic name is given in compliment to Dr. Streets who instituted the genera *Calamorhynchus* and *Leptocotis*.

Streetsia challengeri, n. sp. (Pl. CCVII.).

The Head is deeper than broad, but cylindrical in general appearance from the base to the rostrum; the latter is tapering, dorsally carinate, with serrate edges, and though of great length, shorter than the proximal part of the head; the peræon is dorsally rounded, the segments differing little from one another in length, with rather deep side-plates, of which the upper boundary is distinctly marked, except in the case of the seventh pair, where as so commonly the dividing line is limited to the hinder part of the plate; the pleon is more or less sharply carinate or dorsally angled, its second and third segments having the postero-lateral angles acutely produced.

Eyes of great length, occupying the whole sides of the head as far as the front antennæ, which are fixed just behind the base of the rostrum.

Upper Antennæ very small and slender, first joint of peduncle much longer than the two following together, each of these being broader than long; the first joint of the flagellum tapering, as long as the first of the peduncle, carrying two groups of filaments; the second joint not half the length or breadth of the first, with an apical group of filaments; the third joint narrower and shorter than the second, tipped with setules; there are some setules or cilia on the peduncle and first joint of the flagellum.

Lower Antennæ attached near the base of the head within its channelled lower side; the gland-cone is conspicuous; in addition to this, there is a triangular process of great tenuity, and near to it a little round-headed process, one or both of which may be antennary.

The Mandibles are very short, with a tolerably broad striated cutting edge, the secondary plate of the left mandible nearly as long as the principal, but without the projecting tooth at the upper angle.

The Maxillipeds are very small, not elongated; the inner plate short, distally beset with little setules; the outer plates arching over it are almost as broad at the base as their length; their sinuous inner margin has a wrinkled or striated appearance.

First Gnathopods.—The side-plates deeper than wide; serrate about the lower front angle, which is pointed forwards. The first joint broader above than below, the second very short, the third broader than long, wrist-like; the wrist very large, the convex front margin projecting a little in front of the hand, not apically produced, the hind margin set with small, unequal, partially feathered spines, much of it finely pectinate, the distal part cut into seven teeth, the apex strongly produced, the broad almost straight or slightly sinuous palmar margin within the apex cut into six or eight unequal straight teeth, submarginal to which on both surfaces are rows of many spines of various sizes; the hand shorter than the wrist and not half the width, widening a little from the neck and contracting again near the finger, with the front margin convex, at first smooth but distally set with spines, of which there are many on the surfaces and adjoining the straight, crenulate, and denticulate hinder margin, the apex of which is acute and produced to about half the length of the finger, its inner margin having one or two denticles; the finger is little curved, and has a denticle near the middle of the inner margin.

Second Gnathopods.—Branchial vesicles broader and longer than the first joint. The first joint with the hinder apex strongly outdrawn; second and third joints as in the first pair; the wrist much larger, similarly armed, except that the very elongate hind margin is not pectinate or toothed, the inner margin within the very elongate apex is cut into five or six teeth; the hand though not dissimilar to that of the first pair is narrower in appearance and much longer; the finger is also rather longer and the produced apex of the hand does not reach the middle of it; the much greater length of the apical tooth of the wrist and its oblique distal margin give to these gnathopods a claim to be regarded almost as complexly chelate instead of subchelate.

First Peræopods.—Side-plates with the front margin convex. Branchial vesicles longer and much broader than the first joint, with two lateral accessory pockets, rather longitudinal than transverse, in the upper half. The first joint not quite so long as the third and fourth joints together; the fourth rather longer than the third, the fifth much narrower than the fourth, as long as the third, curved, having like the two preceding joints outstanding spinules along the hind margin, but small ones; the finger slight, less than a third of the length of the fifth joint.

Second Peræopods like the first, but with all the joints longer, and the third rather longer than the fourth.

Third Peræopods.—Within the large bilobed side-plates, just above the attachment of the first joint, there is a very narrow, curved, round-ended process. The first joint widest near the middle, about two and a half times as long as broad, the front margin almost straight, shallowly serrate with a minute setule in each indent, the apex produced into a small tooth, the hind margin convex, carrying small setules, very shallowly serrate below the centre; the second joint with spinules along the front margin; the third joint much longer than the fourth; the fifth a little longer than the third, having a few spinules along the hind margin, and like the two preceding joints several along the front; the finger slender, nearly straight, little more than a fifth of the length of the fifth joint.

Fourth Peræopods.—Branchial vesicles much shorter than the first joint, the upper part much produced behind. The first joint with the greatest breadth near the base, longer and broader than in the preceding pair, considerably longer than all the remaining joints together, the front margin rather sinuous, a little serrate below and produced into a small tooth, the hind margin convex, rising much above and descending much below the front, the lower part shallowly serrate, the produced triangular apex reaching considerably below the second joint; the second joint short, its front margin straight, with an apical tooth, behind which is a second much longer tooth; the third joint as long as the three following joints together, pectinate with strong outstanding teeth along the front margin, and smaller teeth about the apices, of which the front one is a little more produced than the hind one; a spine projects a little above the front apex in this and the next joint; the fourth joint narrower than the third, shorter than the fifth, with varied pectination of the front and apical margins; the fifth joint very little curved, the pectination varied, decurrent; the finger not a third of the length of the fifth joint.

Fifth Peræopods.—The first joint nearly as broad as in the third pair, but much shorter, the muscles occupying a very small portion of the expanse; the second joint a little longer than broad; the third joint as long as the two following together, narrow and narrowing distally; the fourth straight, subequal in length to the fifth; the fifth apically narrowed; the finger not a quarter of the length of the fifth joint.

Pleopods.—Peduncles large and powerful. The coupling spines short, round-headed, with retroverted points; the cleft spine with short nearly equal arms, of which the shorter is a little apically dilated and appears to form a hook, while the longer arm is greatly but unsymmetrically dilated; the joints of the rami number from twelve to fourteen, the first joint of each ramus being long, with several setæ.

Uropods.—Peduncles of the first pair about as long as the coalesced fifth and sixth segments of the pleon, longer than the rami, which are elongate, the outer shorter than the inner, both with denticulate margins, the inner margin being more strongly toothed than the outer; peduncles of the second pair shorter than the rami, which are respectively as long as those of the first pair, with the inner margins much less strongly denticulate; the peduncles of the third pair very little shorter than the outer ramus,

which is nearly smooth on the outer margin, denticulate on the inner; the inner ramus longer than the outer, denticulate on both margins; the inner margin of the peduncles is shallowly serrate and has three teeth at the apex. The peduncles of the first and second pairs have the apex of the inner margin acutely produced; the apices of all the rami are produced into long sharp points.

Telson apparently coalesced with the preceding double segment, carinate, nearly half the length of the head, longer than the first uropods, about four and a half times as long as its greatest breadth, tapering far beyond all the uropods to an acute point. It should be mentioned that fig. *T.*, representing the telson, is drawn to a larger scale than fig. *C.D.*, representing the dorsal aspect of the head.

Length of the outstretched animal a little over an inch.

Locality.—June 20, 1875, North Pacific; lat. 35° 35′ N., long. 150° 50′ E.; surface temperature, 69°·7. One specimen, female.

Genus *Rhabdosoma*, Adams and White, 1847–48.[1]

1840. *Oxycephalus* (*pars*), Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 101.
1847. *Rhabdosoma*, White, List of Crust. in Brit. Mus., p. 130.
1848. „ Adams and White, Zool. of Voy. of H.M.S. "Samarang," p. 63.
1852. „ Dana, Amer. Journ. Sci. and Arts, ser. 2, vol. xiv. No. 41.
1852. „ Dana, U.S. Explor. Exped., vol. xiii. pl. ii. p. 1009.
1858. *Macrocephalus*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. i. p. 361.
1862. *Rhabdosoma*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 344.
1871. „ Claus, Unters. über den Bau und die Verwandschaft der Hyperiden.
1878. „ Streets, Proc. Acad. Nat. Sci. Philad., p. 286.
1879. „ Claus, Die Gattungen und Arten der Platysceliden, pp. 43, 49.
1884. „ Claus, Lehrbuch der Zoologie, trans. by Sedgwick, p. 455.
1886. „ Gerstaecker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 487.
1887. *Rhabdonectes*,[1] Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No, 16. p. 39.
1887. *Rhabdosoma*, Claus, Die Platysceliden, pp. 68, 73.
1887. „ Giles, On Six new Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. pt. ii. No. 2, p. 219.

For the original definition of *Oxycephalus*, see Note on Milne-Edwards, 1830 (p. 143). For *Rhabdosoma*, see Note on Adams and White, 1848 (p. 225). For the definition of *Macrocephalus*, see Note on Spence Bate, 1858 (p. 307). For the definition of *Rhabdonectes*, see Note on Bovallius, 1887 (p. 591), and for a short definition of *Rhabdosoma*, see Note on Claus, 1879 (p. 493).

Claus' fuller account of the genus is to the following effect:—

"The proximal section of the head is elongate, linear, swollen in front to the

[1] Bovallius, in his Systematical List, 1887, says with regard to *Rhabdonectes*, "the name has been substituted for the old name Rhabdosoma, as this latter was already preoccupied by Dumeril for an Ophidian genus," but Duméril's genus is *Rabdosoma* and its date 1853, see *Mém. Acad. des Sciences*, Paris, t. xxiii. p. 440.

strongly widened ocular region, which is followed by the long rostral spine. The anterior antennæ, which can be laid within a deep groove, end in the male with single flagellum-joint, which in the female is lost, while on the other hand the third joint of the peduncle of the female antennæ is dilated (bauchig aufgetrieben) and furnished with numerous olfactory filaments. The antennæ of the second pair are similar to those in *Oxycephalus*, five-jointed, the terminal joint extremely small. The three-jointed mandibular palp of the male is elongate, linear, reaching to the front antennæ. The mouth-organs in general are as in *Oxycephalus* only that the movable part of the upper lip projects shield-like, and the mandibles armed with cutting edge are more considerably shortened. The front limbs are short, complexly chelate. In the third and fourth, and even the fifth,[1] peræopods the first joint is narrow and linear, only the first joint of the fifth is a broad plate of pear-shaped outline, to which I uniformly failed to find any terminal joints attached. Curiously in the male only the third and fourth peræopods have branchial vesicles, while in the female also the branchiæ of the three preceding pairs are retained. Also another obviously striking sexual distinction is observable in the appendages of the peræon, in that especially the first and second peræopods, but also the following pairs, in the female have much stronger and thicker first and third joints. The first three segments of the pleon are very extensive and at least of the length of the whole peræon. The pleopods are distinguished in the male by the thickness and strength of their peduncles, which in the female are weaker and more slender. The following hinder section of the pleon is linear, in the female far more elongate. The eggs are developed in the pouch of the breast protected between the side-wings of the peræon-segments."

The large third joint of the upper antennæ, which Claus regards as part of the peduncle, in this Report is considered to belong to the flagellum. It will be seen in the account of *Rhabdosoma brevicaudatum* that in that species the fifth peræopods appear to have a minute appendage to the first joint. The first three pleon-segments may occasionally be shorter than the peræon.

Rhabdosoma armatum (Milne-Edwards). Specimen A.

1840. *Oxycephalus armatus*, Milne-Edwards, Hist. Nat. des Crustacés, t. iii. p. 101.
1847. *Rhabdosoma armatum*, White, List of Crust. in Brit. Mus., p. 130.
1848. „ „ Adams and White, Zool. of Voy. of H.M.S. "Samarang," p. 63, pl. xiii. figs. 7, 8.
1858. *Macrocephalus longirostris*, Spence Bate, Ann. and Mag. Nat. Hist., ser. 3, vol. i. p. 361.
1862. *Rhabdosoma armatum*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 344, pl. liv. fig. 6.

[1] As this seems contradictory to what immediately follows, I may be mistranslating the original, which is, "An dem fünften und sechsten, auch siebenten Beinpaare, bleiben die Schenkelglieder schmal und stabförmig, nur das Schenkelglied des siebenten Beines ist eine breite Platte von birnförmiger Umgrenzung." It will be remembered that the fifth, sixth, and seventh limbs of the original correspond respectively to the third, fourth, and fifth peræopods of the nomenclature used in this Report.

1862. *Rhabdosoma Whitei*, Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 345, pl. liv. fig. 7.[1]
1871. ,, *armatum*, Claus, Unters. über den Bau und die Verwandschaft der Hyperiden, p. 155.
1878. ,, *whitei*, Streets, Proc. Acad. Nat. Sci. Philad., p. 287, figs. 6, 6*a*, 6*b*.
1878. ,, *armatum*, Streets, Proc. Acad. Nat. Sci. Philad., p. 288.
1878. ,, *longirostris*, Streets, Proc. Acad. Nat. Sci. Philad., p. 290.
1879. ,, *armatum*, Claus, Die Gattungen und Arten der Platysceliden, p. 51.
1887. *Rhabdonectes armatus*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 39.
1887. ,, *Whitei*, Bovallius, Systematical List of Amph. Hyper., Bihang till K. Svensk. Vetensk.-Akad. Handl., Bd. 11, No. 16, p. 39.
1887. *Rhabdosoma armatum*, Claus, Die Platysceliden, p. 74, Taf. xxv. figs. 2–8, Taf. xxvi.
1887. ,, *investigatoris*, Giles, On Six new Amphipods from the Bay of Bengal, Journ. Asiat. Soc. Bengal, vol. lvi. pt. ii. No. 2, p. 219, pl. iv.

Rostrum seven-tenths of an inch long, the total length of the head being one inch; the peræon four-tenths of an inch long, with the first segment very short, and the seventh like the second much shorter than any of the intermediate segments; the first three segments of the pleon together not so long as the peræon, in their slightly curved position measuring three-tenths of an inch; the remainder of the animal to the apex of the telson three-quarters of an inch long; the fourth segment much longer than any of the preceding, longer than the following double segment; the postero-lateral angles of the third pleon-segment very acute, much more produced than those of the two preceding segments.

Lower Antennæ and *Mandibular Palps* not present. The *Second Gnathopods* and first four pairs of *Peræopods* with branchial vesicles. The third and fourth joints in the *First* and *Second Peræopods* rather dilated, this being the case also in a less degree in the *Third Peræopods*, in which the first joint is noticeably longer than the third; the *Fourth Peræopods* are rather shorter than the *Third*, with none of the joints dilated; the lower part of the seventh segment of the peræon corresponding with the side-plate of the fifth peræopods forms behind a forward-directed hook such as Claus figures for this part of the female.

Uropods.—Peduncles of the first pair much longer than the double segment, many times longer than the one remaining ramus; peduncles of the second pair shorter than those of the first, but longer than the double segment, the outer ramus more than half the length of the inner, the inner coalesced with the peduncle and less than a quarter of its length; peduncles of the third pair more slender than those of the first, about as long; the outer ramus rather more than half the length of the inner, longer but more slender than the inner ramus of the second pair; the inner ramus about a third of the length of the peduncle and coalesced with it.

Telson linear, elongate, a little but quite distinctly longer than the third uropods,

[1] *R. curvicorne* on Plate.

uropods, about equal in length to the fourth and coalesced fifth and sixth segments of the pleon together, the apex acute.

Length, in a bent position, two inches and a tenth, fully outstretched about two inches and a half.

Locality.—Station 347, April 7, 1876; Equatorial Atlantic; lat. 0° 15′ S., long. 14° 25′ W.; surface net; surface temperature, 82°. One specimen.

Remarks.—The synonymy of this species is given under reserve, since there was only a single specimen for examination, while other writers have been able to compare several examples. The type described by Milne-Edwards was evidently a male; its length is said to be about an inch, with the head as long as all the rest of the body, and the telson, "un stylet impair," as long as the body. The expressions are vague, since "all the rest of the body" may or may not include the "stylet impair," which is itself said to be as long as the body, the body in this instance probably meaning the peræon and pleon together. Spence Bate describes a female specimen under the name "*Rhabdosoma armatum*," and a male under the name "*Rhabdosoma Whitei.*" Claus both in 1879 and 1887 declares that these are the two sexes of one species. Streets in 1878, under the name "*Rhabdosoma whitei*, Bate," describes a male, and figures a female, and further describes and figures, under the name "*Rhabdosoma armatum* (Edw.), Adams and White," a young male, taken at the same place with six out of his seven specimens of "*Rhabdosoma whitei.*" In the synonymy he states that "*Rhabdosoma armatum*, Adams and White, Voyage of the 'Samarang,' 1850 [1848], Zoology, Crust., p. 63, pl. 13, fig. 7," is not "*R. armatum*, Bate, Catalog. Amphi. Crust., 1862, p. 344, pl. 54, fig. 6," though he recognises that White and Spence Bate are apparently describing the same specimen.[1] Bovallius in 1887 distinguishes "*Rhabdonectes armatus*" from "*Rhabdonectes Whitei*," but whether from his own observation or relying only on published accounts he does not indicate. Dr. Giles gives a beautiful figure of a male specimen, under the name *Rhabdosoma investigatoris*, the measurements of which agree very fairly with those given by Claus for one of his male specimens. In the peræopods of Dr. Giles' specimen the second joint is shown with a very acute apex, and it is so figured by v. Willemoes Suhm in the first three pairs of peræopods, but neither Dr. Giles nor any other author describes this feature, nor could I detect it in the specimen above described. The more obvious and exceedingly striking peculiarities of this genus have so much absorbed attention, that comparatively little has been paid to minuter details. A tooth on the hind margin of the wrist of the first gnathopods is figured both by Claus and Spence Bate for the female of "*Rhabdosoma armatum*"; Spence Bate gives no such tooth in his figure of the first gnathopods of *Rhabdosoma whitei* (*curvicorne*); Streets does not give it

[1] The specimen had clearly suffered some damage before it came into Spence Bate's hands, but even so the pleon in his figure of it cannot easily be reconciled with that in White's.

either for his *Rhabdosoma whitei* or his *Rhabdosoma armatum*. Dr. Giles says of the first and second gnathopods of his species that, unlike those of the forms described by Spence Bate, Streets, and Claus, they "are subequal and very closely resemble each other." When these small appendages are observed with a low power, such a statement would be readily applied to them, and in describing the type-specimen Milne-Edwards is content to say, "pates des deux premières paires extrêmement petites," without the slightest distinction between them, yet in all probability all the forms have the first gnathopods easily distinguishable from the second when highly magnified. The comparative lengths of the segments, the uropods, and the telson would seem to be highly variable according to the age or sex, but other characters when more completely examined than they have hitherto been may suffice for establishing specific distinction between some of the forms included in the synonymy here discussed.

Rhabdosoma armatum (Milne-Edwards). Specimens B, C.

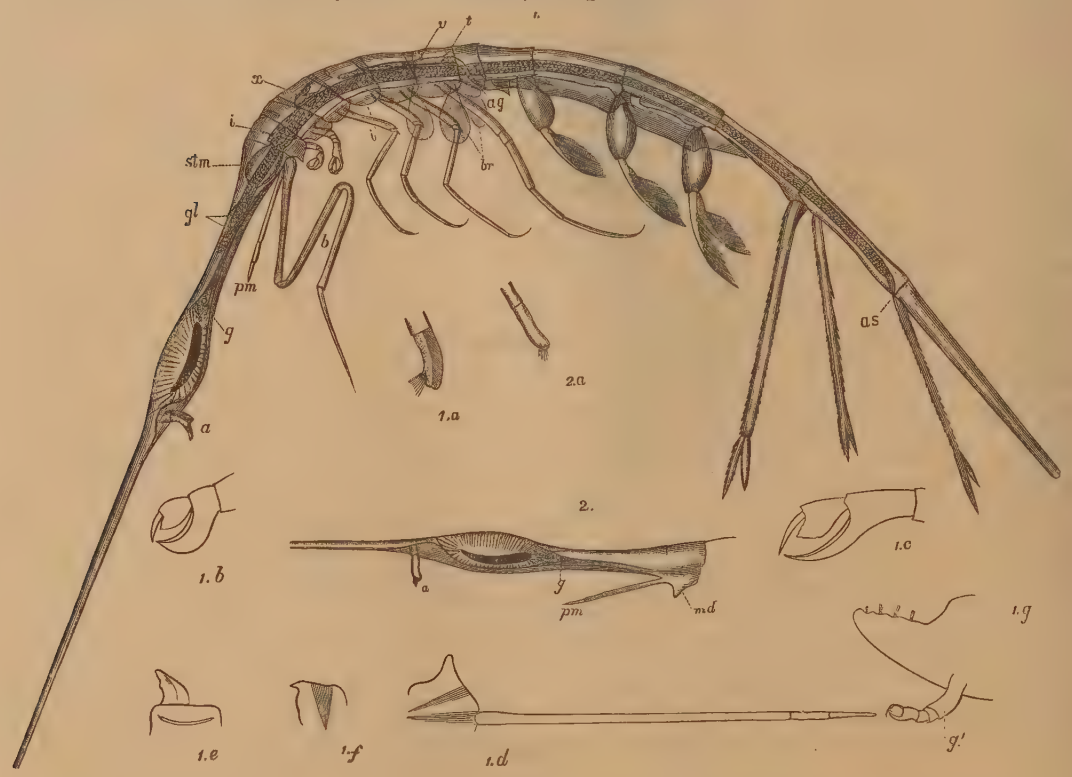

Fig. 32.

The woodcuts here given are reproduced on a reduced scale from a plate drawn by the late R. v. Willemoes Suhm during the voyage, and accompanied by the following explanation in his handwriting :—

"Rhabdosoma Whitei Sp. Bate, Catal. Amph. Crust, pg. 345, Pl. 54, fig. 7. 12 Febr. 75. Western Pacific (♂); lat. 4° 19′ N., long. 130° 15′ E., between the Tulus and Warren Hastings Isl.
♀ in der Melanesian sea, auf dem Wege von Api—Cap York, lat. 14° 7′ S., long. 153° 43′ E. 24 Aug. 74.

Fig. 1. ♂ 10 × nat. Gr.
a Erste, *b* Zweite } Antenne.
br. Branchien.
g Ganglion.
gl Cæca des Darms.
stm Muskelmagen.
i Darm.
t Hoden.
x unbekannter Muskelansatz.
v Herzklappen.
Fig. 1*a*. Erste Antenne des ♂.
Fig. 2. Kopf des ♀ × 10 nat. Gr.
md Mandibula, sonst Buchstaben wie oben.
Fig. 2*a*. 1te Antenne des ♀.
Fig. 1*b* Erster, 1*c* Zweiter } Gnathopod des ♂.
Fig. 1*g*. Unterlippe mit 1tem Gnathop. des ♂.
Fig. 1*d* Mandibula, Fig. 1*e* 1te Maxilla, Fig. 1*f* 2te Maxilla } des ♂."

The specimens referred to have not come into my hands, but it is clear that in fig. 1 the small fifth peræopod by a very natural mistake has been marked as one of the branchial vesicles; the ostia of the heart are placed in the second, fourth, and sixth segments of the peræon, no lateral opening being shown in the third segment; the third and fourth peræopods are drawn with the fingers directed backwards just as in the first and second pairs, instead of forwards, which is their ordinary position; the fourth peræopod is represented as considerably larger than the third, but it may be taken for granted that the two have been transposed, probably owing to an accidental crossing of these delicate appendages in the specimen itself.[1] Fig. 1*g* is said to represent the Unterlippe, that is, the maxillipeds, with the first gnathopod, but the part spoken of as the Unterlippe is more probably the lower part of the first segment of the

[1] Spence Bate in his description of *Rhabdosoma whitei, loc. cit.*, says, "pereiopoda gradually increasing in length posteriorly, the fourth pair being the longest." Streets also says in his account of "*Rhabdosoma whitei*," Bate, in reference to the peræopods, "the remaining thoracic legs simple, first joint not dilated, as slender as the preceding, increasing in length to the sixth," meaning by the sixth thoracic legs the fourth peræopods. Nevertheless it seems to me altogether improbable that the form should differ in this respect from all the rest of the Oxycephalidæ, whether in this genus or in other genera of the family. When for convenience of delineation the legs are stretched out in the figure apart from one another below the body, mistake seems impossible, but in the specimen itself the limbs are apt to get very mixed in appearance, so that in the entanglement an observer, guided by an earlier description, might readily adopt an error which in the first instance was easy enough to make. This consideration lessens the weight which would necessarily be attributed to the agreement on the point in question between Spence Bate, Streets, and v. Willemoes Suhm.

peræon answering to the side-plate. Fig. 2 is stated to be the head of the female, ten times the natural size, with the mandible. Since, however, the mandible has a three-jointed palp, the specimen was no doubt a male, although, to judge by the anterior antennæ, a young one. In both specimens the mandibular palp is figured as perfectly straight, not with the two short terminal joints forming a sickle-like curve, the curvature probably being developed only at a more advanced period of life than that which either of these specimens had attained.

Rhabdosoma brevicaudatum, n. sp. (Pl. CCVIII.).

Rostrum broken, the remaining portion with the neck and ocular region a quarter of an inch long, the neck being by itself one-tenth of an inch; in front of the mouth organs there is a strongly projecting tooth or process on the ventral surface at the base of the head; the peræon about three-twentieths of an inch in length, with the dorsal outline convex, the first segment short, the second longer than the first, but shorter than any of the following, the seventh not much shorter than any of the four preceding segments; the first three segments of the pleon together as long as the peræon, the postero-lateral angles of the first acute, but not produced backwards, those of the second very slightly produced, those of the third very acute and much produced backwards, the lower margin of the third segment being much more convex than that of the two preceding segments; the remainder of the pleon to the end of the telson equal in length to the first three segments, but to the end of the uropods measuring a quarter of an inch; the fourth segment about half the length of the following double-segment.

Upper Antennæ placed in the ventral groove of the head just in front of the oval ocular region; the first joint of the peduncle considerably longer than the second; the one-jointed flagellum longer than the peduncle, the distal margin carrying a few filaments.

Lower Antennæ wanting.

Mouth Organs not well observed; the *Maxillipeds* appear to have the outer plates apically pointed; the *Mandibles* without palp.

First Gnathopods very short; the first joint with sinuous front and convex hind margin; the second joint broader than long; the third joint a little longer than the second, distally widened; the wrist large, widest where it joins the hand, the hind process longer than the proximal part of the joint, and longer than the hand, ending in a sharp apical tooth, a little way above which a piece of the hind margin is finely denticulate, the inner or front margin of the process being similarly denticulate; the hand has a very convex front margin, the hind margin beyond the neck being slightly convex and distally a little denticulate, the distal margin finely pectinate and supplying

a small convex palm; the finger curved, small, yet more than half the length of the hand and reaching much beyond the palm, having a little denticle on the concave margin.

Second Gnathopods longer than the first, with all the joints longer, but very similar; the pectinate palm of the hand is more strongly convex, while the front margin of the hand is much less so; the finger is much more than half the length of the hand.

First Peræopods.—First joint widening distally, with concave front margin, not very elongate; the second joint not longer than broad, with a little pectination of the convex hind margin; the third joint oval, broader and scarcely shorter than the first joint, almost filled with gland-cells, the front margin fringed with little spinules; the fourth joint a little broader than the fifth, but much shorter; the fifth narrow, slightly curved, shorter than the third, both this and the fourth joint having spinules along the front margin; the finger long and slender, more than half the length of the fifth joint, curved at the tip.

Second Peræopods differing little from the first except in their greater size, which chiefly depends on the longer third joint, the fifth joint also being rather longer than in the preceding pair, but very decidedly shorter than the third joint.

Third Peræopods.—Branchial vesicles lying parallel to the body, much larger and more conspicuous than the three preceding pairs. This pair of limbs the longest; the first joint very moderately dilated, the front margin faintly serrate and still more minutely pectinate on the front margin; the second joint scarcely longer than broad, with the convex front margin slightly pectinate; the third joint narrower than the first and a little shorter, having a very small portion of its space occupied by muscles; the fourth joint little more than half as long as the third; the fifth slender, a little curved, nearly as long as the third, having like the two preceding joints small spinules along the front margin; the finger slender, about a third as long as the fifth joint.

Fourth Peræopods very similar to the third, but considerably shorter, the first joint rather longer and broader, but the third shorter and much narrower, the fourth joint also smaller in proportion, and the fifth joint not very much longer than the fourth; the finger straight, acute, about half the length of the fifth joint.

Fifth Peræopods.—The lower part of the segment (corresponding to the side-plate) having the angles rounded both before and behind, the front part of the lower margin a little excavate. The first joint of the limb small, scarcely reaching below the margin of the segment, expanded so as to form a sort of triangle, with the sides nearly equal and more or less convex; the apex below seems to be formed by a partially coalesced second joint, from which projects an extremely minute two-jointed appendage, of which the terminal joint is acute.

Pleopods.—The peduncles long and slender; coupling-spines not perceived; cleft spine having a small subapical dilatation to the longer arm; the interlocking process on the first joint of the outer ramus much bent; the joints of the rami numbering from six to eight.

Uropods.—The first pair long and slender, prismatic in section, the peduncle longer than those of the other two pairs, much longer than the rami and also longer than the double segment, the outer and inner margins pectinate, the teeth on the inner margin being shorter, much more numerous and less decurrent than those on the outer; both members of this pair are unfortunately broken, but the fragment of one is preserved, and shows an outer ramus probably half the length of the peduncle, with long decurrent teeth on the inner margin, some also on the under margin, and the outer margin serrate; the inner ramus about a third of the length of the outer, with short decurrent teeth on the outer margin, the series not reaching to the apex, the inner margin very closely pectinate, the apex slightly curved, with a spine-like ending; the second pair are much more slender than the first, the peduncles reaching a little beyond the double segment, near to the base of which they are attached; the upper and inner margins have slender decurrent teeth, the outer margin being sparingly serrate; the inner ramus is more than half the length of the peduncle, coalesced with it and similarly armed; the outer ramus minute, not a sixth as long as the inner, having two or three long decurrent teeth on each margin; the third pair are more slender than the first, but less slender than the second, the peduncles shorter than the double segment, with smooth outer margin and spine-like rather distant teeth on the inner; the inner ramus nearly as long as the peduncle with which it is coalesced, longer than the rami of the other pairs, having both margins armed with decurrent teeth; the inner ramus slender, minute, perhaps a tenth as long as the outer, carrying one decurrent tooth on the inner margin.

Telson coalesced with the preceding segment, but abruptly narrower, about a third as long as the peduncles of the third uropods, very little broader at the base than at the apex, which is neatly rounded and finely pectinate with little teeth which are longest at the centre of the margin.

Length.—The specimen outstretched measured four-fifths of an inch, the rostrum being broken.

Locality.—Station 352, April 13, 1876; North Atlantic; lat. 10° 55′ N., long. 17° 46′ W.; surface; surface temperature, 77°·7. One specimen, female.

Remarks.—The specific name refers to the shortness of the telson, which is unique among the species hitherto named as belonging to this genus. It may, I think, be presumed that the specimen is a female, since not only are the lower antennæ and mandibular palps wanting, but the third joint in the peræopods has the dilatation

which appears to be a distinctive character of the female in this genus; the first three pairs of branchial vesicles, which are wanting in the male, were also here faintly discerned.

The following table shows the distribution of the Oxycephalidæ as illustrated by the Challenger specimens:—

1. Station 13, March 4, 1873; between Tenerife and St. Thomas; lat. 21° 38′ N., long. 44° 39′ W.; surface temperature, 72°. (*Leptocotis.*)

2. April 29, 1876, North Atlantic; lat. 18° 8′ N., long. 30° 5′ W.; surface, night; surface temperature, 73°·7. (*Oxycephalus.*)

3. April 28, 1876, North Atlantic; lat. 17° 47′ N., long. 28° 28′ W.; surface; surface temperature, 73°·5. (*Oxycephalus.*)

4. April 27, 1876, North Atlantic; lat. 17° 18′ N., long. 26° 32′ W.; surface temperature, 73°·5. (*Oxycephalus.*)

5. April 26, 1876, off St. Vincent, Cape Verde Islands; lat. 16° 49′ N., long. 25° 14′ W.; surface temperature, 73°·2. Four specimens. (Three specimens are probably *Oxycephalus clausi*, and one probably *Oxycephalus porcellus.*)

6. Station 352, April 13, 1876; North Atlantic; lat. 10° 55′ N., long. 17° 46′ W.; surface; surface temperature, 77°·7. One specimen (*Rhabdosoma brevicaudatum*).

7. Station 104, August 23, 1873; Equatorial Atlantic; lat. 2° 25′ N., long. 20° 1′ W.; surface; surface temperature, 78°. (*Oxycephalus clausi.*)

8. Station 106, August 25, 1873; Equatorial Atlantic; lat. 1° 47′ N., long. 24° 26′ W.; surface to 100 fathoms; surface temperature, 78°·8. One specimen, in Canada balsam (*Leptocotis*, ♂, with the upper antennæ having only a small upward produced point), and one specimen, in Canada balsam (*Leptocotis*, ♀).

9. Station 347, April 7, 1876; Equatorial Atlantic; lat. 0° 15′ S., long. 14° 25′ W.; surface net; surface temperature, 82°. One specimen (*Rhabdosoma armatum*), and one specimen (*Oxycephalus*).

10. Surface, Atlantic. One specimen (*Oxycephalus*).

11. "Oxycephalus ♂, Atlantic, surface." Two separately mounted specimens.

12. October 5, 1873, South Atlantic; lat. 29° 1′ S., long. 28° 59′ W.; surface temperature, 66°. "Oxycephalus, ♀."

13. November 10, 1873, Simon's Bay, Cape of Good Hope; "Vibilia and Oxycephalus." The two specimens are mounted in Canada balsam, the "Oxycephalus" evidently belonging to the genus *Calamorhynchus.*

14. Station 330, March 8, 1876; South Atlantic; lat. 37° 45′ S., long. 33° 0′ W.; surface; surface temperature, 64°·2. One specimen (*Calamorhynchus rigidus*).

15. "Oxycephalus oceanus, ♀," off Kandavu, Fiji Islands. Two specimens in Canada balsam.

16. "Oxycephalus, Alciope, Euphausia larva, West Pacific." One specimen, in Canada balsam, with others not Amphipoda.

17. "Oxycephalus, ♀, West Pacific." One specimen, in Canada balsam.

18. Station 227, March 27, 1875, West Pacific; lat. 17° 29′ N., long. 141° 21′ E.; surface; surface temperature, 79°·2. (*Oxycephalus*).

19. Station 180, August 24, 1874, between Api and Cape York; lat. 14° 7′ S., long. 153° 43′ E.; surface temperature, 80°. One specimen (*Rhabdosoma armatum*, ♂).

20. South Pacific, between Api and Cape York; surface. One specimen (*Oxycephalus porcellus*). One specimen, in Canada balsam. "Oxycephalus oceanus, ♀."

21. Station 215, February 12, 1875, Western Pacific; lat. 4° 19′ N., long. 130° 15′ E.; surface temperature, 81°·8. One specimen (*Rhabdosoma armatum*, ♂).

22. February 12–20, 1875, Western Pacific, off the north coast of New Guinea. "Oxycephalus oceanus, Guérin."

23. February 9, 1875, West Pacific; lat. 5° 33′ N., long. 125° 33′ E.; surface temperature, 80°. One specimen, in Canada balsam, young male (probably *Leptocotis mindanaonis*).

24. Off Mindanao, Philippines; surface. One specimen (*Leptocotis mindanaonis*).

25. April 3, 1875, North Pacific; lat. 24° 49′ N., long. 138° 34′ E.; surface; surface temperature, 71°·5. Five specimens (*Oxycephalus clausi?*).

26. Station 230, April 5, 1875, North Pacific; lat. 26° 29′ N., long. 137° 57′ E.; surface; surface temperature, 68°·5. Several specimens (*Oxycephalus clausi?*), and one specimen (*Oxycephalus porcellus*).

27. Pacific, between Admiralty Islands and Japan. "Oxycephalus." Two specimens, ♂, in Canada balsam. The lower antennæ not fully developed.

28. June 20, 1875, North Pacific; lat. 35° 35′ N., long. 150° 50′ E.; surface temperature, 69°·7.

29. Station 241, June 23, 1875; lat. 35° 41′ N., long. 157° 42′ E.; surface; surface temperature, 69°·2. (*Oxycephalus.*)

30. July 4, 1875, North Pacific; lat. 36° 42′ N., long. 179° 50′ W.; surface, night; surface temperature, 71°·5.

31. July 1875, between Japan and Honolulu; surface. (*Oxycephalus clausi?*).

32. Station 271, September 6, 1875; Mid Pacific; lat. 0° 33′ S., long. 151° 34′ W.; surface temperature, 78°·7. One specimen (*Oxycephalus porcellus*), and one specimen, imperfect (*Oxycephalus clausi?*).

33. Station 287, October 19, 1875, South Pacific; lat. 36° 32′ S., long. 132° 52′ W.; surface; surface temperature, 57°·8.

To the distribution of the family thus shown, must be added from other sources the Indian Ocean, the Mediterranean, the Caribbean Sea, and New Zealand. The range may therefore be considered to encircle the globe from east to west, but, so far as at present known, not to extend into the colder waters either north or south.

APPENDIX TO THE BIBLIOGRAPHY.

1775. FABRICIUS, J. C.

Systema Entomologiæ.

For the definition of the Agonata see Note on Fabricius, 1775 (p. 40). In this group, at page 415 of the Systema, is placed the species *Astacus crassicornis*, of which Fabricius' description has been already quoted in the discussion of the genus *Scinà*, p. 1271. As already noticed, Herbst in 1796 described the same species under the name "Cancer (Gammarellus) *crassicornis;*" but while by the name "Cancer (Gammarellus)" he led the way to the inclusion of this species among the Amphipoda, he at the same time shut the gate against it by retaining the erroneous characters of the original description. Hence the species has passed through a long period of neglect; but that Herbst was right in the matter of classification is made clear by the figures in the unpublished *Museum Banksianum*, which have attached to them the name *Cancer crassicornis*, and the signature "Sydney Parkinson pinx^{t}. 1768." It is quite possible that the original description was made, not from an actual specimen, but from Parkinson's drawing, which is certainly suggestive of eight pairs of limbs. The eighth segment attributed to the thorax, I now think, is not so well to be accounted for by the inclusion of the head, as by the supposition that the fold of the skin between the peræon and pleon has been converted into an eighth segment to meet the exigencies of an extra pair of legs.

The volume containing the figures just referred to is preserved at the British Museum in Cromwell Road. An inscription at the beginning reads as follows:—"Zoological drawings by Sydney Parkinson in Capt. Cook's First Voyage 1768–1771." Besides the *Cancer crassicornis* it contains the following Amphipoda:—

"Onidium spinosum. Sydney Parkinson pinx^{t}. 1768.," three figures, respectively dorsal, ventral, and lateral, about five inches long, intended apparently for life-size, and evidently representing the *Cystisoma* which Fabricius describes as *Oniscus spinosus*.

"Onidium gibbosum. T. 15. P. Sept. 7. 1768.," with a monogram, seven figures which no doubt refer to the *Oniscus gibbosus* of Fabricius, but the enlargement is not sufficient to help out the description to any important extent. The fifth peræopods are very small.

"Onidium oblongatum. T. 16. P. Sept. 7. 1768.," with a monogram, two figures representing one of the Hyperina, but without sufficient enlargement to show clearly the position of the species. The magnified figure gives the two pairs of gnathopods and the last peræopods as very much smaller than the intermediate feet.

"Onidium quadricorne. Sydney Parkinson pinx^{t}. ad vivum. T. 2. P. 2. August 28. 1768.," two figures, which no doubt represent the *Oniscus quadricornis* of Fabricius, a species identified with *Hyperia medusarum* (O. F. Müller).

Dr. Günther kindly made search at my request for the specimens from which Sydney Parkinson's drawings were made, but the Amphipoda could not be found among the specimens still preserved in the cabinets of the "Banksian Museum."

1793. Fabricius, J. C.

Entomologia Systematica. (See p. 59.)

In the account of this work it should have been mentioned that the Amphipods include, besides "*Astacus Homari*," *Astacus crassicornis*, Fabricius, a species which has been already discussed, pp. 1271, 1617.

The new genus *Cymothoa* is thus defined, p. 503 :—

"*Os* absque palpis et mandibulis. *Antennæ* sæpius quatuor æquales, sessiles.

"Cymothoæ corpus oblongum, glabrum, immarginatum, tardum, segmentis quatuordecim transversis, brevibus : posticis minoribus, antico sive capite minore, oculis ovatis, lateralibus, antennis brevibus, sub capite insertis, cauda foliolis quatuor, pedibus quatuordecim, brevibus, unguiculatis, colore obscuro."

The Amphipods which Fabricius includes in this genus are 12. *Cymothoa bicaudata*, 17. *Cymothoa spinosa*, and 21. *Cymothoa Ceti*. *Cymothoa bicaudata* has the synonym "Oniscus bicaudatus. Mant. Ins. 1.241.11. Linn. Syst. nat. 2.1060.8. Fn. Sv. 2062.," a species which Pallas in 1766 identifies with his own *Oniscus volutator*, while Fabricius here as elsewhere makes Pallas' species a synonym of his own *Gammarus longicornis*. *Cymothoa spinosa* is a new name for the *Oniscus spinosus*, of which the description has been quoted at page 40. *Cymothoa* as originally constituted must have been tolerably comprehensive, since the three species of Amphipoda placed in it have since been referred respectively to genera so remote as *Corophium*, *Cystisoma*, and *Cyamus*. In the Supplementum, 1798, Fabricius assigns four species instead of twenty-four to *Cymothoa*, adding, "Cymothoas reliquas mihi minus notas ad ulteriorem disquisitionem sepono;" of the remaining twenty he assigns ten to *Idotea* (*Idothea*, Index, p. 27, 1799), one to *Ligia*, and one (*Cymothoa ceti*) to *Pycnogonum*, leaving eight to be accounted for.

1802. Bosc, L. A. G.

Histoire Naturelle des Crustacés. (See p. 67.)

In the Introduction, at page 79, Bosc names a new genus, which he places between *Gammarus* and *Cyamus*, and defines as follows :—

"*Genre* XXXIV. Liparis, *Liparis*. Corps filiforme, long ; pattes alongées. (Ovaires placés sous le troisième et quatrième anneau.)

"Exemp. du genre. *Squilla lobata*, Fab."

He takes no further notice of this genus in his subsequent descriptions. The reference to *Squilla lobata* of O. F. Müller and O. Fabricius shows that *Liparis* is a synonym of *Caprella*, Lamarck, 1801.

1824. Parry, William Edward.

Journal of a second voyage for the discovery of a north-west passage from the Atlantic to the Pacific; performed in the years 1821–22–23, in his Majesty's ships Fury and Hecla, under the orders of Captain William Edward Parry, R.N., F.R.S., and Commander of the expedition. London, MDCCCXXIV.

In the Bay of Shoals, lat. 66° 31′ 59″ N., long. 83° 48′ 54″ W., he notices that "there were considerable flocks of the long-tailed duck feeding on the innumerable shrimps (*cancer nugax, of Phipps's Voy.*) with which the sea swarmed in all this neighbourhood," p. 113.

At page 126 he says, "I have before mentioned the myriads of small shrimps (*cancer nugax*), which for some weeks past had been observed near the surface of the sea. These insects were found to be still as numerous as ever [October] in any hole we made in the ice;

and such was the extreme avidity with which they immediately seized upon any meat put overboard to thaw or soak for the sake of freshness, that Captain Lyon to-day sent me a goose to look at, belonging to the officers of the Hecla, that had been thus deposited within their reach only eight and forty hours, and from which they had eaten every ounce of meat, leaving only a skeleton most delicately cleaned. Our men had before remarked that their meat suffered unusual loss of substance by soaking, but did not know to what cause to attribute the deficiency. We took advantage, however, of the hunger of these depredators to procure complete skeletons of small animals, for preservation as anatomical specimens, enclosing them in a net or bag with holes, to which the shrimps could have access, but which prevented the loss of any of the limbs, should the cartilage of the joints be eaten. For want of this latter precaution some specimens were at first rendered imperfect."

This account of the voracity of the Arctic Amphipoda tallies with what is said by Holbøll, 1842, Sutherland, 1852, and Goës, 1865.

1824. SABINE, E.

A supplement to the Appendix of Captain Parry's Voyage for the discovery of a north-west passage, in the years 1819–20. Containing the zoological and botanical notices. London, MDCCCXXIV. Marine Invertebrate Animals, by Captain Edward Sabine. pp. ccxix–ccxxxix.

The zoological part of this work had already appeared in 1821 without any variation from the present edition except in the numbering of the pages; thus, for example, in a list of synonyms, "*Gammarus loricatus*, Sabine, Appendix to Capt. Parry's Voyage of Discovery, p. 58, 1821," and "*Gammarus loricatus*, Sabine, Supplement to the Appendix of Captain Parry's Voyage, p. ccxxxi. 1824," are practically one and the same reference. See Note on Sabine, 1821.

1828. Ross, J. C.

In Narrative of an attempt to reach the North Pole, in boats fitted for the purpose, and attached to his Majesty's ship Hecla, in the year MDCCCXXVII., under the command of Captain William Edward Parry, R.N., F.R.S. London, MDCCCXXVIII. Appendix. Zoology. By Lieutenant (*now Commander*) James Clark Ross, R.N., F.L.S.

Under the heading "Marine invertebrate animals," the following notices of Amphipoda are given on pages 203–205.

"9. CAPRELLA SCOLOPENDROIDES.

"Caprella Scolopendroides. *Lam.* v. p. 174. *App. to Parry's Third Voyage*, p. 118.

"Gammarus Quadrilobatus. *Zool. Dan.* iii. p. 58, Plate 114, fig. 11, 12, Female.

"Squilla Quadrilobata. *Zool. Dan.* ii. p. 21, Plate 56, fig. 4, 5, 6, Male.

"Squilla Lobata. *Fabr. Faun. Groenl.* p. 248.

"The specimens of this species, which were taken in a net to the northward of Low Island, are of a size intermediate between those figured by Müller and those obtained, during Captain Parry's Third Voyage, at Port Bowen. The spines along the back were hardly visible without the aid of a microscope; and the second pair of legs are inserted in the anterior part of the second segment of the body, and not in the centre of it, as in the plates referred to.

"10. Gammarus loricatus. (Sabine.)
"Gammarus (Gen.) *Lamarck*, v. p. 179.
"Gammarus Loricatus. *Supp. to Parry's First Voyage*, p. ccxxxi. Plate 1, fig. 7. *App. to Parry's Third Voyage*, p. 118.
"Found on the shores of Walden Island amongst sea-weed.
"11. Gammarus Sabini. (Leach.)
"Gammarus Sabini. *Leach, in Ross's Voyage*, octavo edit. ii. p. 178. *Supp. to Parry's First Voyage*, p. ccxxxii. Plate 1, fig. 8–11. *App. to Parry's Third Voyage*, p. 118.
"Taken in a net from a depth of 80 fathoms, in the Polar Sea, in lat. 81° 6′ N.
"12. Gammarus Boreus. (Sabine.)
"Gammarus Boreus. *Supp. to Parry's First Voyage*, p. ccxxix. *App. to Parry's Third Voyage*, p. 119.
"Abundant on the shores of Low Island and in Hecla Cove. A dead specimen was found on the ice in lat. 82°¼ N.
"13. Gammarus Ampulla.
"Gammarus Ampulla. *Supp. to Parry's First Voyage*, p. ccxxix.
"Cancer Ampulla. *Phipps's Voyage, App.* p. 192, Plate 12, fig. 2.
"Taken from the stomach of a young seal which was shot in lat. 82°½ N. It is rather difficult to determine whether this animal belongs to the genus *Gammarus* or *Talitrus;* but this difficulty may possibly arise from the antennæ of many of the individuals being imperfect.
"14. Talitrus Nugax.
"Talitrus Nugax. *App. to Parry's Third Voyage*, p. 119.
"Gammarus Nugax. *Supp. to Parry's First Voyage*, p. ccxxix.
"Cancer Nugax. *App. to Phipp's Voyage*, p. 192. Plate xii. fig. 3.
"Taken off Low Island, and in Hecla Cove, abundantly.
"15. Talitrus Edvardsii. (Sabine.)
"Talitrus Edvardsii. *Supp. to Parry's First Voyage*, p. ccxxxii. Plate ii. fig. 1, 4. *App. to Parry's Third Voyage*, p. 119.
"Abundant in the Polar Sea; great numbers were taken in a net from a depth of eighty fathoms, in latitude 81° 6′ N., and some dead specimens were found on the loose ice to the northward of the Seven Islands, in lat. 82° N."

The *Caprella scolopendroides* of this and of Ross's earlier Appendix is perhaps the same as *Ægina spinosissima*, Stimpson (see Note on Ross, 1826, p. 130, and Note on Miers, 1877, p. 468). The reference to *Cancer ampulla*, Phipps, mentions fig. 2, instead of fig. 3, which is the number in the original both in the text and on the Plate. This error in the reference to Phipps' species is, for some reason, of common occurrence.

1841. Vallot, Jean Nicolas.

Observations sur la chevrette, crevette des ruisseaux, crevette puce, (*gammarus pulex*). Sciences physiologiques et médicales. pp. 171–183. (Actes de l'Académie des Sciences de Bordeaux pour 1841.)

This author thinks that it is the same species which occurs in brooks and wells, variously coloured, and known by many different names, of which he gives derivations; chevrette from the Latin *caprella;* crevette from *crabette*, petit crabe; gammarus from caris marina, "un nom hybride formé de grec et de latin" [!]; agrouelle or égrouelle from Gesner's scrophulæ aquaticæ. The three pairs of pleopods, he says, are called *pattes branchiales.* In regard to the branchial vesicles, of which he does not admit the branchial function, he curiously says that he has never been able to find them. He denies that the males carry about the females between their feet, though he allows that some of these

animals may often be seen carrying others about in this manner, but he adds, "elles finissent par les ronger sur le dos, jusqu'à ce que les ayant tuées elles abandonnent le cadavre." After referring to the statements of Baster, Roesel, Cuvier and others, with regard to the eggs being carried in the mother's ventral pouch, he owns that he has seen nothing of all this, but he says, "je me suis assuré que les crevettes pondent une espèce de frais gélatineux pareil à celui de plusieurs testacés univalves d'eau douce."

Besides the above rather singular statements, some useful criticisms are given on the figures in Roesel and Baster and the authors who copied directly or indirectly from Roesel. Vallot says that *Squilla fluviatilis*, Merret, Pin. p. 192, has nothing to do with la crevette des ruisseaux, as supposed in l'*Encycl. méthod. ins.*, t. vi. p. 187, No. 7, and le *Dict. des Sc. nat.*, t. 28, p. 354, for that Merret is not speaking at all of *Gammarus pulex*, but only of the larva of *Dytiscus marginalis*, "signalée par Rondelet, *de piscibus fluviatil. lib.*, *Cap.* xxxvii. p. 112, sous la rubrique de *squilla fluviatili.*"

He refers to M. Flourens, *Act. Divion.*, 1838, p. 83, for evidence that the crevette swallowed alive would perish at once in the stomach; to M. Hippolyte Cloquet, *Enc. méthod. syst. anatom.*, t. iv. p. 498, for the capacity of these animals to clear the skeletons of moles, rats and the like; to Thulis and Bernard, *Journ. de phys*, 1786, t. xxviii. p. 67; *Journ. d'hist. nat.*, 1787, No. 21, p. 320; *Icthyol. de la France*, Supplem., p. 34, for the phosphorescence of the fresh-water shrimp, observed at midnight in June; and lastly, states that of six crevettes frozen into a mass of ice, which was allowed to thaw slowly, three regained animation and lived for more than a month afterwards.

1844. Örsted, A. S.

De regionibus marinis. Elementa topographiæ historiconaturalis freti Öresund. Hauniæ, MDCCCXLIV.

In the "Regio Trochoideorum" extending from the shore to seven or eight fathoms, Örsted found "*Talitrus saltator* Edw.—*Orchestia littorea* Leach.—*Metoecus Medusarum* Kr. in *Medusa aurita.*—*Hyperia sp. nov.?* cum præcedente in Med. aur.—*Gammarus Sabbini* Leach, Hellebaek—Hveen.—*Gammarus Locusta* Fabr." (p. 67). *Corophium longicorne* mentioned on p. 64 seems to have been omitted from the general list by an oversight. In the "Regio Gymnobranchiorum" he includes "*Caprella linearis* Latr. Kullen—Hellebaek—*Leptomera pedata* Latr. Hellebaek" (p. 73). In the "Regio Buccinoideorum. Profunditas," the Amphipoda are "*Amphitoe sp. nov.?* Kullen—*Podocerus Laechii* Kr. Hellebaek" (p. 78). Of the *Amphitoe* he gives no description, but merely says in a footnote, "Tentaculis longis circumagendis efficit planum depressius rotundum, ex cuius centro solum caput rubrum, cetero corpore latente, prominet." He makes some incidental remarks on the adaptation of the species to their respective localities.

1850. De Natale, Giuseppe.

Su pochi Crostacei del porto di Messina. *Lettera* del Dottor Giuseppe de Natale socio corrispondente dell' Academia giornia di Catania al Sig. Achille Costa *con una tavola in rame.* Napoli, 1850. pp. 1–16.

The discovery of two species of Crustacea, which, as he supposes, belong to the "Iperini Gammaroidi a piccol capo," the Vibilidæ, which had hitherto included only a single genus *Vibilia* and a single species *Peronii*, leads de Natale to the discussion of the organic value of the Crustacean chela and its modifications, in regard to which he says, "questi passagi graduati

dalla mano didattila [chela] al gancetto, e da questo all ugna rigida immobile, sono così insensibili, che io non mi so con quanta ragione, in quest' ultimi tempi vi si dice tanto valore da fondar su di essi caratteri non specifici ma generici." Now to *Vibilia peronii*, he observes, Milne-Edwards assigns "una mano didattila ai piedi del secondo pajo, e quelli del primo si terminano, secondo lui, per una mano subcheliforme, che risponde quasi ad un gancetto. Or il primo Crostaceo che nella stessa famiglia io metto, e che da me fu detto Orattrina e che tu ravviserai disegnato al microscopio nella fig. 1ª. non presenta chela di sorta alcuna, e offre la miglior semplicità immaginabile in tutti gli arti suoi, che son tutti terminati da semplici ugnette e che nemmeno son frangiati di peli." Had this been the only difference between *Vibilia* and *Orattrina*, he would have been content to have instituted at most a new species, science being, he thought, still in its infancy in the matter of distinguishing variations truly specific from those which are merely climatic. The other and more important characters which led him to establish the new genus *Orattrina*, he gives as follows :—

"Essa è allungata, ingrossata un pochin sul mezzo, ristretta a punta verso il capo e la coda. Il capo, distinto come primo anello, porta due paja d'antenne ; le superiori sono cortissime, larghe, laminari, non cilindriche come nella Vibilia, e ci danno l'apparenza della lamina che giace come sostegno del peduncolo delle antenne superiori nelle Astacidi e Palemonidi. I loro articoli son due ; il primo è corto, globoso ; il secondo, doppio di lunghezza del primo, è terminale e laminare. Le antenne inferiori son pur cortissime, impiantate immediatamente sotto le precedenti ; hanno tre soli articoli distinti, e appena escon fuor delle superiori in avanti. L'animale, nell' acqua, mentre che è vivo, le spiega, le divarica ai lati e in sopra ; ma dietro morte, compariscono come una mobile punta che corre dal capo in avanti. Gli occhi risaltano pel color nero, come un rettangolo ai lati del capo, lasciando fra essi un breve spazio lineare. La bocca sporge come lieve tubercolo, ai fianchi e dentro a cui le mascelle son come d'ordinario disposte ; i palpi che le stan dietro sono picciolini, triarticolati e gracili. Tutti i piedi toracici son simili tra essi, unguicolati tutti, ambulatori, ad articoli gracili e cilindrici. Il primo, il quinto e settimo pajo sono cortissimi, ma i tre articoli del primo pajo son gracili tutti, mentre i basilari del quinto e settimo pajo sono un pochino ingrossati. I piedi del secondo, terzo e quarto pajo sono più lunghi, ma tutti i loro articoli, eccettuato il basilare che è grosso, son gracili e cilindrici. Il sesto pajo è più forte di tutti, e presenta esso solo un dente rilevato sull' orlo posteriore dei suoi articoli.

"Io non ho potuto ravvisarvi i grandi palpi articolati che Edwards attribuisce alla Vibilia ; la mano subcheliforme al primo pajo di piedi, e la chela al secondo pajo mancano qui egualmente. I primi falsi piedi addominali si fanno, come nella Vibilia, rilevare per la grossezza del lor peduncolo basilare, a capo a cui s' inserisce un altro articolino, e poi una vera lamina triangolare membranosa, liscia, non orlata nè di peli nè di dentelli. Sai tu bene, che simili piedi nella Vibilia, sono dentellati e frangiati di lunghi peli agli orli. Finalmente la miglior differenza che ho potuto ravvisare tra la Vibilia e l'Orattrina mia, è negli ultimi falsi piedi che in quest' ultima costituiscono una notatoja molto complessa. Il quarto falso piede è gracile e terminato da due stiletti cilindrici a tre articoli diretti in dietro orizzontalmente ; il quinto pajo è cortissimo ed ha due articoli indistinti ; il sesto pajo finalmente è il più robusto di tutti ; porta di fatti un potente articolo basilare fiancheggiato dai piedi seguenti, con due stiletti terminale, e con un appendice ibiliforme[1] ai lati suoi. Il corpo poi si termina per un segmento picciolissimo di forma conica."

Fig. 2 shows the *Orattrina*, as seen from above, with the uropods spread out, and the back as it were tri-lobed. After calling attention to this appearance of the back, de Natale sums up the differences which he found between *Orattrina* and *Vibilia*, and gives the reason for the specific name.

[1] What *ibiliforme* means I have no idea ; it occurred to me at first that it might be a misprint for *vibiliforme*, with the meaning *as in Vibilia*, but the explanation would still need explaining.

"I suoi caratteri specifici sono:

"Orattrina *Pulchella* (Nobis): *Corpore erythrino, antice posticeque subulato; longitudine altitudinis sextuplum fere æquante; segmento terminali corporis conico brevissimo, articulis pedum thoracicorum sextæ seriei postice unidentatis, reliquibus pedibus glabris edentulis.*"

The length is not more than seven lines, and the specimens occur in abundance in company with *Orio zancleus*, *Phrosine*, *Typhis*, *Phronima*, etc. Very much rarer is the next species, which he at first thought was a little fish.

"Erpetoramphus Costæ: fig. 3." "Il nome di Erpetoramphus che io gli diedi per questo te ne darà la ragione. Il suo capo, di fatti, somiglia, quando è di troppo ingrandito, a quello acuto di una Lucertola, terminasi per un lungo rostro affilato a punta, rigido, immobile, all' estremo di cui mostrasi una membranella con appendice membranosa, e credo che questa osservata con ingrandimenti maggiori, ci darebbe due picciolissime antenne, e di queste produzioni di fatti non ha traccia alcuna altrove, ond' io sono portato a crederle antenne vere. Gli occhi son piccioli, rotondetti, neri e posti ai fianchi del capo, alla parte posteriore del quale ove s'immette esso coll' anello primo del torace ed in sotto, risalta come lieve tubercolo la bocca, i cui pezzi mandibolari sono secondo l'ordinario disposti e costrutti. I piedi mascellari, che quì li chiameresti palpi, son esilissimi, gracilissimi, a tre articoli indistinti. Gli anelli toracici son lisci, non solcati come nell' Orattrina. Ma il primo pajo di piedi deve dare a quest' animaluzzo grand' ajuto nelle sue prede, poichè esso è cortissimo e robusto di troppo a paragone della sua taglia, a due articoli peduncolari brevissimi, ma il terzo è largo, trapezoedro, compresso, e terminato da una mano didattila dentellata agli orli. Il secondo pajo di piedi toracici lo vedrai gracile, cilindrico, a tre articoli ben conformati, l'ultimo de' quali presso a poco eguale al precedente si termina a punta senza mostrare ugnetta accessoria. Gli articoli basilari dei piedi del terzo, quarto, quinto e sesto pajo si dilatano in una lamina ovoidea diafana, e tutte queste lamine nel riposo copronsi imbricate a vicenda; il terzo ed il quinto pajo sono i più lunghi, e tutti terminansi unguicolati. Il settimo pajo è quasi simile al secondo, ma presenta un' ugnetta terminale. I primi tre anelli addominali sono larghi quanto i toracici, i falsi piedi che ne pendono in giù sono analoghi a quelli dell' Orattrina, ma vanno più brevi quanto più corron dietro, e l'ultimo ne è picciolissimo.

"I tre ultimi anelli addominali restringonsi un pochino, e l'ultimo convertesi in una coda inarticolata terminale; i loro piedi son trasformati in notatoja codale di tre lamelle, di cui le due anteriori sono lamellose e terminate a punta, l'ultima più o men cilindrica e subulata.

"È pur picciolino quest' Erpetoramphus, e tien fra gli altri caratteri anco la statura, ed i colori dell' Orattrina, e con essa si accompagna ma è molto raro, ed i due soli che ne tengo li conservo con assai cura presso di me. Come ti dissi, io ne consacrai a tuo padre la scoperta; ne vuoi i caratteri della specie? Eccoteli:

"Erpetoramphus *Costæ* (Nobis). *Corpore erythrino, antice posticeque subulato, longitudine decuplum altitudinis fere æquante; oculis rotundatis nigris; pedibus edentulis, segmento caudæ terminali conico.*"

After deciding that *Vibilia*, *Orattrina*, and *Erpetoramphus* are certainly animals of the same family, he proceeds to consider the species called *Bivonia culicina* by Cocco in 1832. Having compared a specimen of this with Milne-Edwards' description of *Phronima*, he says,

"Ti penserai già la meraviglia che mi ebbi quando trovai una Fronima in tutti suoi caratteri generici, il capo, i palpi, i piedi tutti, il torace, l'addome erano similissimi; l'unica differenza che vi rimarcai era nella presenza di due paja di lunghe e filiformi antenne, così sottili come un capello.

"Il pajo superiore come vedrai nella fig. 4, è nel suo corto e grosso peduncolo simile all' inferiore, ma nel primo pajo al di là di quest' articolo basilare corre un altro gracile, cilindrico, inarticolato, a corpo a cui s' innestano molti articoletti picciolissimi, fino all' ultimo che diventa

veramente microscopico. Le antenne inferiori però al di là del peduncolo corrono capillari, mollissime, inarticolate. Il disegno che ne offro te ne mostrerà chiaro il fatto. Eccoti adunque una Fronima con due paja di lunghe, e gracilissime antenne."

De Natale fancies that all specimens of *Phronima* hitherto observed may have had the antennæ mutilated. Nature, he says, rarely introduces one modification of an animal without correlated variations. "Possibile che conservati i caratteri tutti d'una Fronima, la natura avesse voluto innestarvi due paja di corna senz' altro? Io ci stento a crederlo, e inclino troppo a credere che le Fronime hanno sempre due paja di gracilissime antenne, che la Bivonia *culicina* di Cocco è una Fronima. Terrai come ti aggrada questa mia maniera di pensare, il fatto è che io tengo presso di me una Fronima con 2 paja d'antenne gracilissime. La specie che te ne dò, la chiamo *Coccoi* ad onore del suo scopritore; essa è una specie distinta. Picciolina di 3 a 4 linee al più, cristallina con punti aranciati disseminati, distinguesi dalla Phronima *sedentaria* perché non ha come questa un sol dente sul taglio interno del dito della mano didattila, ma ne ha 5 e cospicui, e non presenta come questa l'antipenultimo articolo dei piedi delle due prime paja prolungato sotto del gancetto. Non è la Ph. *Atlantica* che ha due denti al gancetto della chela. Sarà la Ph. *sedentaria* di Risso? Ma quest' ultima è così mal nota, tanto informe il disegno, che non se ne può tener conto. Abbiti adunque la " Phr. Coccoi (Nobis). *Hyalina, punctis aurantiacis adspersa; dentibus quinque conspicuis in manu didactyla.*"

The figure and the description of *Phronima coccoi* alike make it clear that de Natale had obtained the male of some species of *Phronima*, of what species it might not be easy to decide even if we had his specimen. His *Orattrina pulchella* beyond doubt belongs to the genus *Vibilia*, and is probably a synonym of *Vibilia jeangerardii*, Lucas, with which it agrees at any rate so far as the antennæ and the colour are concerned. It is pretty evident from the figures that de Natale's account of the gnathopods was based on insufficient examination, and the trilobation which he ascribes to the body was most likely due to accidental wrinkling of his specimen. It may be, however, noticed that Luças says of his species, "le cinquième segment abdominal [in the Latin by mistake septimo segmento abdominis] paraît comme trilobé en dessus. *Erpetoramphus costæ* comes perhaps as near to *Oxycephalus similis*, Claus, from Messina, as to any other of the hitherto described Oxycephalidæ. It is rather singular that de Natale should not have noticed its affinity to his own recently described *Ornithoramphus*.

Boeck's account of this paper is, that its author describes "two Hyperids, namely, *Orattrino pulchella*, Natali, which seems to be a *Vibilia*, and *Reptorramphus Costæ*, which looks like a *Platycheles*. His description of them is very short, and the figures are inadequate." Why Boeck changes *Erpetoramphus* into *Reptorramphus* is not explained, nor is it clear what he means by the comparison with *Platycheles*, a genus unknown among Amphipoda.

The genus *Seba*, which, from the reference in the Brit. Mus. Catal. Amph. Crust., p. 159, might have been expected to occur in this pamphlet, is not mentioned in it, and I hear from Prof. A. Della Valle that A. Costa, to whom Spence Bate attributes the genus, expressly denies having established it.

1854. BATE, C. SPENCE.

The Annals and Magazine of Natural History. Ser. 2. Vol. XIII. London, 1854. p. 504.

The name *Bellia*, Sp. Bate, 1851, as preoccupied, is here changed to *Sulcator*, itself a synonym of *Haustorius*, P. L. S. Müller.

1856. THOMPSON, WILLIAM, died February 17, 1852 (R. Patterson in Preface).

The Natural History of Ireland. In four volumes, 1849–1856. Vol. IV. London, 1856.

Pages 395 to 400 give lists of Amphipoda and Læmodipoda, with a long note on *Chelura terebrans*, Philippi, and some short notes on other species. Of "Gammarus fluviatilis, Edw.," he says, "I have found the stomach of the *Salmonidæ*, from Lough Neagh, often entirely filled with it." One entry is "*G. longimanus*, Leach (sp.). *Mæra longimana*, Leach MSS. A single one taken with last [*G. campylops*, Leach]:—same as Leach's unique specimen in the British Museum." He has also found "*Gammarus punctatus*, Johnst.," and "*Amphithöe fucicola*, Leach (sp.)," meaning by the latter Leach's *Pherusa fucicola*. He gives the size and colouring of the Belfast species of *Anonyx*, "which," he says in a parenthesis, "is well worthy of the name of *elegans*." His list of Gammarina contains seventeen species, of Hyperina three, "*Hyperia galba*, Mont. (sp.)," "*H. Latreillii*, Edw.," and "*Lestrigonus*, sp." The Læmodipoda include nominally seven species.

1860. RENTSCH.

Homoiogenesis. Beitr. z. Natur- u. Heilkunde. 1860. (Nervous system of Gammarus ornatus.)

I am indebted for this reference to A. S. Packard's Bibliography of the nervous system of Crustacea.

1861. SILL, VICTOR.

Beitrag zur Kenntniss der Crustaceen, Arachniden und Myriopoden Siebenbürgens. Verhandlungen und Mittheilungen des siebenbürgischen Vereines für Naturwissenschaften zu Hermannstadt. XII. Jahrgang. *Hermannstadt*, 1861. N^ro. 1. Januar, 1861. p. 3. Zweiter Beitrag zur Kenntniss der Crustaceen und Arachniden Siebenbürgens. N^ro. 11. November, 1861. pp. 181, 182.

On page 3 descriptions are given of "Gammarus puteanus *Koch*" and "Gammarus fossarum *Koch*," quoted without material alteration from Koch's work (see Note on Koch, 1835, p. 159).

At page 181 Sill makes the following observations :—

"Gammarus pulex *Fabr.* (Koch : Heft 36. Nro. 21). Er ist $\frac{3}{4}''$ lang, von derselben Gestalt wie G. fossarum, doch an den scharfen, zahnartigen Spitzen des 8., 9. und 10. Körperringes leicht zu erkennen ; es ist nämlich der Hinterrand dieser Ringe in ein scharfes, stachelartiges Zähnchen verlängert. In Wassergräben (Grossscheuern).

"Vergleichen wir nun Gammarus pulex mit Gamm. fossarum und puteanus (S. Verh. und Mitth. Nro. 1 Jahrg. 1861) so finden wir als charakteristisches Unterscheidungszeichen das Fehlen oder Vorhandensein der Dornen. Daher unterscheidet auch M. Edward's Gamm. pulex (ohne Dornen) und Gamm. fluviatilis (mit starkentwickelten Dornen) ; während Koch dem mit Dornen der Namen Gamm. pulex gab und aus dem ohne Dornen Gamm. puteanus und fossarum machte.

"Die Herrn Cornel Chyzer und Alexander Tóth in Pest [1]) vereinigen aber Gammarus fluviatilis Miln. Edw. mit Gammarus pulex F. und stellen den mit Dornen als Varietät mit dem Namen Gamm. spinosus auf.

[1] Siehe der Naturfreund Ungarns, herausgegeben von Dr. J. von Nagy und A. F. Láng, IV. Heft. Neutra 1857.

"Die Dornenlosen unterscheiden sich nämlich von den mit Dornen auch durch die Form der Augen, welche bei den Letztern deutlich nierenförmig, bei den Erstern oval sind. Dieser Charakter ist so constant, dass man von der Form der Augen auf das Vorhandensein oder Fehlen der Dornen und umgekehrt schliessen kann. Es gibt aber auch Individuen bei welchen die Dornen sehr schwach ausgeprägt sind, ja sogar nur ein einziger ganz schwacher Dorn vorhanden ist.

"Diese Uebergangsformen sind wohl geeignet, die vielleicht unrichtige Benennung und Unterscheidung von Gamm. puteanus fossarum und pulex Koch—dahin zu berichtigen, dass blos Gamm. pulex Fabr. mit der Varietät spinosus beizubehalten sei."

From the reference here given to Dr. Cornel Chyzer, it may be surmised that he takes notice of some fresh-water species of *Gammarus* in his work "Ueber die Krustaceenfauna Ungarns. Verhandl. des Zool. Bot. Vereines 1858," which is mentioned in a bibliographical list by Dr. Anton Frič.

1862. WALKER, DAVID.

Notes on the Zoology of the last Arctic Expedition under Captain Sir F. L. M'Clintock, R.N. [Read Friday Evening, April 27, 1860.] The Journal of the Royal Dublin Society. Vol. III. 1860–61. Dublin, 1862. pp. 61–77.[1]

An introductory observation states that, "with a very few exceptions, none of the species of birds, fishes, mollusca, crustacea, and insecta are strictly confined to the Arctic regions." The Amphipoda are recorded as follows on page 68 :—

"† ‡ *Gammarus loricatus* (Sab.).—Numbers found swimming about in Port Kennedy.

"† ‡ *Gammarus locusta* (Mont.).—Associated with the former and following species at Port Kennedy.

"† ‡ *Gammarus boreas* (Sab.).—Ditto.

"† ‡ *Amphitoe Edwardsii* (Sab.).—Near Cape York, 15 fathoms.

"† ‡ *Amphitoe Sabini* (Leach).—Caught in a garbage net in numbers at Port Kennedy.

"† ‡ *Acanthosoma hystrix* (Owen).—Near Cape York, 15 fathoms.

"‡ *Lysianassa vahlii*
"† ‡ *Lysianassa appendiculata* } (Kroyer).—Found at Port Kennedy.

"‡ *Stegocephalus ampulla* (Kr.).—Two very fine specimens obtained at 10 fathoms in Port Kennedy.

"† ‡ Themisto Arctica (Kr.).—Found in the stomach of a seal at Port Kennedy."

"Specimens of species marked thus † are deposited in the Museum of the Royal Dublin Society. Specimens of species marked thus ‡ are deposited in the Queen's College, Belfast."

Page 69 contains "a comparative table, showing the number of crustacean species brought home by the several expeditions under Parry, Ross, Penny, Belcher, and M'Clintock." Seventeen species of Amphipods are named, including besides those already mentioned, "*Gammarus Sabini* (Leach)"; "*G. Kroyeri* (Bell)"; "*G. nugax* (Fabr.)," said in a foot-note to be "now usually referred to genus Lysianassa"; "*Amphitoe Jurinii* (Kr.)"; "*A. læviusculæ* (Kr.)"; "*Lysianassa sagenæ* (Kr.)"; "*Metoecus Cyaneæ* (Sab.)." *Gammarus sabini* (Leach) and *Amphitoe sabini* (Leach) are both of them credited to Ross' Second Voyage and to Penny's, while the two names are divided between the other voyages, Parry's first and second and Belcher's receiving *Gammarus sabini* and M'Clintock's the synonymous *Amphitoe sabini*. *Lysianassa appendiculata* is attributed only to M'Clintock's voyage, and to that with a note of interrogation.

[1] Attention is called to this paper in the Nat. Hist. of Greenland, 1875, and in Hansen's Malac. mar. Groenl. occid., 1887.

1864. GRUBE, A. E.

Ueber ein neues Crustaceum; *Icridium fuscum* Grube, pp. 58–59 (read February 18), and Ueber die Crustaceen-Fauna des adriatischen und Mittelmeeres, pp. 59–64 (read April 1). Einundvierzigster Jahres-Bericht der Schlesischen Gesellschaft für vaterländische Cultur. Enthält den Generalbericht über die Arbeiten und Veränderungen der Gesellschaft im Jahre 1863. Breslau, 1864.

As to *Icridium fuscum*, see Note on Grube, p. 348. In the second paper Professor Grube briefly describes the following new species :—

"*Allorchestes stylifer*, der *Amphithoë Prevosti* ähnlich, aber mit verhaltnissmässig längeren oberen Antennen und einem ansehnlichen Fortsatz am drittletzten Gliede des zweiten Fusspaares beim Männchen, wie bei *A. australis*." (See p. 365).

"*Iphimedia multispinis*, sehr auffallend gezeichnet, blassröthlich mit Querreihen orangegelber Flecken, der Endrand des 7. und der drei nächsten Segmente mit 1 Paar langer Rückenzähne, des 8., 9. und 10. ausserdem mit 1 unpaaren Zahne vor jenen, sonst aber nicht bewaffnet, die Hüftplatten der vier vorderen Beinpaare in eine spitze Zacke auslaufend, Augen oval, im Uebrigen der *I. nodosa* ähnlich." (See pp. 348, 353.)

"*Protomedeia guttata*, am meisten mit *Pr. pilosa* übereinstimmend, aber mit 3 Rückenzähnchen auf dem 11. Segment, auch ganz anders gefärbt : chamois mit Querreichen brauner Tropfen." (See p. 366.)

"*Cerapus latimanus*, von *C. abditus* besonders durch die Bildung der Hand des zweiten Fusspaares abweichend, die hinten nur $\frac{1}{3}$ schmäler als der *Carpus* und hier am Unterrand ausgeschnitten ist, ebenso durch die längeren Zähne des *Carpus* und durch die viel längere und allmälig zugespitzte Klaue." (See p. 349.)

"*Caprella quadrispinis*, von der Gestalt von *C. phasma* (Mont.), mit 1 Zahn auf dem Kopf und dem 1. Segment und 2 neben einander auf dem zweiten, welches so lang als jene zusammen ist. Das 2. sehr lange und vor der Mitte angesetzte Fusspaar hat an der gestreckten Hand einen dreizackigen Unterrand, sie ist so lang als der Schenkel, viel länger als das zweite Segment selbst." (See p. 1244.)

"*Caprella gracilipes*. Der Körper sehr schlank, das 1. Segment kürzer als der Kopf; das 2. sehr gestreckt und über der Insertion seines Fusspaars, nahe am Hinterrande, knotig verdickt, der Schenkel dieses Fusspaars äusserst dünn und lang, die Hand dagegen kurz und breit mit vorderem unteren Ausschnitt, vor und hinter welchem 1 Zahn." Mayer pronounces this description insufficient for the recognition of the species, but evidently based on a male specimen.

1869. NORMAN, A. M.

Last Report on dredging among the Shetland Isles, by J. Gwyn Jeffreys, F.R.S., Rev. A. Merle Norman, M.A., W. C. M'Intosh, M.D., F.L.S., and Edward Waller. *In* Report of the thirty-eighth meeting of the British Association for the Advancement of Science ; held at Norwich in August 1868. London 1869.

The Amphipoda, by Norman, are reported on pages 273 to 288, with a postscript, pp. 335–336. The new species described are *Probolium serratipes*, which in 1886 Norman still leaves

under that title, probably awaiting an examination of the mandibles for its transfer to *Metopa* or *Stenothoë*; *Œdiceros æquicornis*, which "comes near to *Œ. brevicalcar* of Goës"; *Syrrhoë hamatipes*, of which Norman says, "I place this species provisionally in the genus *Syrrhoë*; the head having been crushed, I am unable to speak with precision respecting the eyes and rostrum;" *Atylus macer*, a species not mentioned in the Museum Normanianum, 1886, and almost certainly not belonging to *Atylus*, since the fifth and sixth pleon-segments are apparently not coalesced; *Megamphopus cornutus*, "species typica"; *Protomedeia pectinata; Cyrtophium armatum*, of which Norman says, "the sixth and seventh segments of the pereion appear to be coalesced. It approaches *Lætmatophilus tuberculatus* of Bruzelius, but is much more strongly tuberculated, and the gnathopods of different structure, the first smaller, the second larger, the hand broader, and the basos spined"; in 1886 he names it *Lætmatophilus armatus; Corophium tenuicorne*, the female only observed, and that "resembling in general characters the same sex of *longicorne* and *crassicorne*." The new genus *Megamphopus* is defined as follows:—

"Antennæ slender (imperfect), the insertion of the lower so much behind that of the upper that the end of the third joint of the peduncle is only on a level with the end of the head. First segment of pereion produced forwards and downwards on each side into a remarkable horn-shaped process. Both pair of gnathopods greatly developed, of equal size, and subchelate. First three pereiopods short, last two much longer. Telson tubular."

There are numerous notes on species not new, referring principally to the synonymy. On page 275, "*Anonyx ampulla* (Phipps). *Cancer ampulla*, Phipps," is given by mistake for *Cancer nugax*, Phipps. Descriptions more or less complete are given of the species named "*Probolium Alderi* (Bate) = *Montagui Alderi*, B. & W."; "*Ampelisca æquicornis*, Bruzelius"; "*Ampelisca tenuicornis*, Lilljeborg"; "*Ampelisca carinata*, Bruzelius, . . . = *Ampelisca Gaimardi*, Bate, . . . (but not *A. Gaimardi* of Kröyer and Bruzelius)"; "*Ampelisca lævigata*, Lilljeborg"; "*Ampelisca macrocephala*, Lilljeborg," with the remark that "the *Ampelisca Belliana* of Bate appears to be referable to this species"; "*Eusirus Helvetiæ*, Bate = *Eusirus bidens*, Heller"; "*Aora gracilis*, Bate = *Autonoë punctata*, Bruzelius"; "*Microdeuteropus anomalus* (Rathke). *Gammarus anomalus*, Nova Acta Leop. 1843, p. 63, pl. iv. fig. 7, = *Autonoë anomala*, Bruzelius, Skand. Amphip. Gammarid. p. 25, pl. i. fig. 4 (but scarcely *Microdeutopus anomalus*, Bate & Westwood, Brit. Sessile-eyed Crust. p. 289), = *Microdeutopus gryllotalpa*, Bate & Westwood, *l. c.* p. 289 (but not of Costa)"; "*Microdeuteropus versiculatus*, Bate"; "*Microdeuteropus Websteri*, Bate," with the remark, "I question whether there are sufficient grounds for separating the genus *Aora* from *Microdeuteropus*"; "*Protomedeia* (?) *Whitei*, Bate," with the suggestion that it is the female of "*Lilljeborgia Shetlandica*"; "*Protomedeia hirsutimana*, Bate," which in 1886 Norman calls *Ptilocheirus hirsutimanus*, Bate; "*Hyperia oblivia*, Kröyer, Grönlands Amphipoder, p. 298, pl. iv. fig. 19 (but not *H. oblivia*, Bate & Westw. vol. ii. p. 16)"; "Bate and Westwood's '*H. oblivia*,' which has not the propodos of the gnathopods at all produced, cannot be Kröyer's species nor that here described;" "I would propose for it the name of *H. gracilipes*"; "*Metoëcus medusarum*, Kröyer, Grönlands Amphip. p. 288, pl. iii. fig. 15 (not *Hyperia medusarum*, Bate, Cat. Amphip. Crust. Brit. Mus. p. 295)." The specimen for which the name *Hyperia gracilipes* is here suggested more probably, however, belongs either to *Parathemisto* or (on the supposition of its not being full grown) to *Euthemisto* (see p. 1420).

The Postscript, besides remarks on other species, says of Bate and Westwood's *Hyperia tauriformis*, "this is the *Metoëcus medusarum* of Kröyer and of this Report. B. & W.'s specimens were from Banff, forwarded by Mr. Edward, to whom I am also myself indebted for specimens." The species is now named *Hyperoche medusarum* (Krøyer).

On *Syrrhoë hamatipes* and *Megamphopus cornutus*, see pp. 788, 1108.

1872. Boeck, A.

Bidrag til Californiens Amphipode fauna. (See p. 410.)

A separate copy of this paper lent me by a friend was devoid of the illustrative plate, which my friend assured me had never been published. The volume of the "Forhandlinger i Videnskabs-Selskabet i Christiania Aar 1871. Med 3 lithographerede Plader," containing Boeck's paper, possessed three plates as promised on the title-page, but none of the three had anything to do with the species which Boeck describes. Mayer, Die Caprelliden, p. 12, also says that he is indebted to G. O. Sars for the information that the plate in question was never printed. In May, however, of this year to my surprise I was able to obtain from Oswald Weigel in Leipzic a separate copy of the paper with the missing plate.

The figures confirm the view taken in my account of *Caprella scaura*, Templeton, p. 1267, that the *Caprella californica* described by Boeck is one of the synonyms of that species. The rounded apex of the hand in the second gnathopods is rather conspicuously produced in Boeck's figure, and the tooth on the inner margin of the finger near its hinge has an appearance slightly differing from what is found in other figures and specimens which I have regarded as belonging to Templeton's species, but these small variations are of no great weight in themselves, and may, I think, be in part attributed to the accidental condition of the specimen figured.

The species named *Caprella verrucosa*, which Mayer thought might possibly be the young of *Caprella acanthifera*, Leach, is shown by the figures to come nearer to one or other of the forms that have received the specific name *tuberculata*. It is distinguished from *Caprella acanthifera* by the very prominent frontal tooth or horn, and from all other species of *Caprella* by the considerable size of the process of the hand in the second gnathopods of the male, a deep cavity being formed between this process and the distal part of the hind margin which is slightly concave. Boeck himself says that the species "is so peculiar by its short antennæ and its body beset with large, finely tuberculated warts, and lastly by the slight difference in the structure of the body in the two sexes, that it cannot be confused with any other described species."

1873. Frič, Anton (see Note on Frič, 1872, p. 415).

Die Krustenthiere Böhmens. Archiv für die naturwissenschaftliche Landesdurchforschung von Böhmen. Zweiter Band. Zweiter Theil. Mit 1 lithogr. Tafel und 126 Holzschnitten. Prag, 1873. pp. 201–271.

The preface is dated "Prag im Juli 1871." The account of the Amphipoda is given on pp. 264, 265. It contains the following descriptions :—

"Gatt. *Gammarus*. Die oberen längeren Fühler tragen an der Spitze ihren 3gliedrigen Stieles, neben der langen Geissel, einen kurzen 5gliedrigen Faden; die beiden vorderen Fusspaare in beiden Geschlechtern Greiffüsse, deren hakiges Endglied sich gegen das verdickte Fussblatt einschlägt. Die Afterfüsse der beiden letzten Hinterleibsglieder und die beiden Endanhänge des Schwanzes sind gabelige Springstiele."

"*Gammarus pulex*, Fabr. [Fig. 99]. Das vorletzte Glied des ersten Fusspaares ist birnförmig und nach vorne in eine kurze Spitze ausgezogen. Die Augen rund, die unteren Fühler sind mit kurzen Haaren versehen. Jedes der 3 hintersten Leibessegmente hat am Hinterrande 3 Borstenbüscheln, von denen die seitlichen zu 2–3 Borsten zu enthalten pflegen. Die Farbe ist gelblich grün oder bräunlich. Länge 10–15 mm. Leben in reinen Quellen und

den darans entstehenden Bächen, wo sie den Fischen und namentlich den Forellen eine gute Nahrung liefern. Bei Prag kommen sie am nächsten im Cibulkabache vor und haben Exemplare von dort häufig in ihrem Darmkanal einen Echinorhynchus."

"*Gammarus puteanus*, Koch. [Fig. 100]. Das vorletzte Glied des ersten Fusspaares ist schief viereckig, vorne viel breiter als hinten. Augen fehlen. An dem hinteren Rande der ersten drei Leibessegmente sehr feine Stacheln, an den letzten drei fehlen die Borstenbündel. Farbe stets weiss."

The figures would require discussion, only that they seem to be of a conventional character. In the definition of the genus *Gammarus*, it can scarcely be necessary to give the number of joints in the accessory flagellum of the upper antennæ.

1873. GODET, PAUL.

Bulletin de la Société des Sciences naturelles de Neuchatel. 1870 à 1873. Tome neuvième. Neuchatel, 1873. *Séance du* 21 *décembre* 1871. pp. 153–155.

Of three specimens of *Gammarus* found in a well at Neuchatel, the largest measured, without the antennæ, 32 mm. in length, the smallest about 12 mm. The largest was distinguished by the extraordinary length of the last uropods. "The species is distinguished," Godet says, "from our *Gammarus fluviatilis* by the following characters:—absence of eyes: penultimate joint [hand] of the two pairs of anterior feet [gnathopods] of triangular shape, almost as broad as long: upper antennæ very long, of about 51 joints." He compares it with the somewhat obscure *Gammarus puteanus* of Koch, and with the *Gammarus puteanus* of La Valette. To judge by the figure, it cannot be far remote from *Niphargus aquilex*, Schiødte.

1873. HESSE, EUGÈNE.

Mémoire, &c., see Note on page 417.

There are some difficulties connected with M. Hesse's description and figures of his species of *Ichthyomyzocus*, which require discussion. The dorsal view, fig. 3., of "*Ichthyomyzocus Morrhuæ*" is strongly suggestive of *Lafystius sturionis*, Krøyer, 1842, a species which has been taken, according to Bruzelius, on *Gadus morrhua*, *Acipenser sturio*, and *Galeus canis*, according to S. I. Smith, in the mouth of a goose-fish (*Lophius americanus*), and which is labelled in the Challenger collection as taken parasitic on *Cottus*. There seems a strong improbability that the cod should have two parasitic Amphipods so like one another in general appearance, in the head, antennæ, claws, and uropods, as *Lafystius sturionis* and *Ichthyomyzocus morrhuæ*, if these are to be considered distinct species. On the other hand, if they are the same, M. Hesse's account is open to much criticism. Of the seven rings of the thorax (peræon-segments), he says that "aucun d'eux ne présente de pièces épimériennes sur les côtés," whereas in *Lafystius sturionis* all these segments have the usual side-plates. He represents the first three pairs of thoracic legs as practically all alike in form and direction, and similarly the last four pairs, whereas in Krøyer's species the two pairs of gnathopods differ as usual to some extent from the first two pairs of peræopods, and, though all the five pairs of peræopods are very much alike, the first two pairs according to rule face the last three, not one another. *Ichthyomyzocus morrhuæ* and *Ichthyomyzocus lophii* are placed under the heading "B.—"Abdomen formé de cinq articles et terminé par trois paires de tiges," yet in the specific description of the former we read "l'abdomen contient aussi sept anneaux,"

and of the latter "l'abdomen se compose aussi de sept anneaux." *Ichthyomyzocus squatinæ* stands under the heading "C.—Abdomen formé de deux articles et terminé par deux paires de tiges," and for this the specific description, without any inconsistency, says, "la partie abdominale est relativement extrêmement courte, puisqu'elle ne se compose que de deux anneaux." But, to compensate for this diminished abdomen, M. Hesse assigns ten segments to the thorax, which would at once remove the species from the Amphipoda and the Edriophthalma altogether. The figure, however, shows plainly that three of these ten thoracic segments belong to the abdomen or pleon. It is a little perplexing that, though fig. 19 gives to this species only two pairs of uropods in accordance with the text, fig. 26, on the contrary, depicts three pairs. *Ichthyomyzocus ornatus* is placed under the heading "A—Abdomen formé de cinq articles et terminé par trois tiges." Fig. 1 represents this species with a very narrow pleon, carrying a pair of uropods at the distal corners of the fifth segment; between these is what looks like a very narrow segment coalesced with the preceding and having the two rami of a uropod attached to its distal end not quite centrally. It is clear that M. Hesse's single specimen was defective. The absence of the telson from this and the preceding species can scarcely be accepted without corroboration. To determine the true position of all these species, further details must be awaited, and their peculiarities seem well worth a careful investigation.

1874. DALL, W. H.

On New Parasitic Crustacea, from the N.W. Coast of America. (Published in advance, March 3d, 1874.) Proceedings of the California Academy of Sciences, Volume V. 1873–1874. San Francisco, June, 1875. pp. 254, 255.

"On examination," Mr. Dall says, "of a small collection of parasites, in the collection of the Academy (presented by Captain C. M. Scammon, and reported to have been procured from a Pacific Right Whale, near the Island of Kadiak, Alaska, in 1873) I find that it contains two species, both apparently undescribed." The first he describes as *Cyamus tentator*, n. sp., which, he says, "is readily distinguished from *C. mysticeti*, Dall, by its spiked 'hands' and knobby branchial segments; and from *C. Scammoni* by its straight unequal branchiæ, long antennæ, knobs, and the shape of the head." The second he describes as *Cyamus gracilis*, n. sp., and says that "the prominent features of this species are its slender and compact form, short antennæ, and weak and inconspicuous posterior limbs."

Lütken decides that *Cyamus gracilis* is the same as the species already so named by Roussel de Vauzème, and *Cyamus tentator* the same as de Vauzème's *Cyamus ovalis*.

1874. SCAMMON, CHARLES M.

The marine mammals of the North-western Coast of North America, described and illustrated: together with an account of the American Whale-fishery. San Francisco, 1874.

Of the Californian Gray Whale (*Rhachianectes glaucus*, Cope), he says, p. 21, "both sexes are infested with parasitical crustaceans (*Cyamus Scammoni*), and a species of barnacle (*Cryptolepas rhachianecti*), which are chiefly upon the head and fins." In a footnote Dall's description of "*Cyamus Scammoni*, n. sp." is quoted from "Proceedings Cal. Acad. Sci., Nov. 9th, 1872." A footnote to the description of the Humpback Whale (*Megaptera versabilis*, Cope), p. 38,

quotes Dall's description of "*Cyamus suffusus*, n. sp." from "Proc. Cal. Acad. Sci., Dec. 18th, 1872." In the description of the Bowhead or Great Polar Whale (*Balaena mysticetus*, Linn.), it is remarked, p. 57, that "the Arctic Bowhead is comparatively free from parasitic crustaceans, as well as barnacles. Occasionally, however, a species of *Cyamus* is present about the head or fins," and a footnote quotes Dall's description of "*Cyamus mysticeti*, n. sp.," including by an obvious misprint "Length 33 inches; breadth (of body) 16 inches." The species of *Cyamus* are also referred to in Dall's Appendix, at pp. 301, 302, 305, on the latter page *Cyamus tentator*, Dall, and *Cyamus gracilis*, Dall, being mentioned as parasites of *Balaena sieboldii*.

In describing the gambols of the Sperm Whale (*Physeter macrocephalus*, Linn.), at p. 77, Scammon says, "These singular antics of the Sperm Whale are said to be performed in order to rid itself of a troublesome parasite, known among the whale-fishers by the name of 'Suckfish'; but the animal is seldom infested with the parasitic crustacea, which are indigenous to the rorquals and Right Whales."

On this point and on the species of *Cyami* here mentioned, compare Note on Lütken, 1887.

1875. Allman, G. J.

Instructions on the Construction and Method of Using the Towing Net, and Notes on the Animals which may be obtained by its employment. *In* Instructions for the use of the Scientific Expedition to the Arctic Regions, 1875. London, 1875.

Under *Arthropoda*, at p. 57, Dr. Allman says, "Among the invertebrate life which abounds in Arctic seas, and which from the concurrent testimony of Arctic voyagers constitute a characteristic feature of their fauna, will be found the *Amphipodous Crustacea*. These are small active animals, most familiarly known to us by the 'sand hoppers' of our own shores. In Arctic regions they are often attracted in countless multitudes by fragments of offal thrown into the sea. To such an extent do they abound there that the carcass of a seal has been in a few hours reduced by them to the condition of a clean skeleton. They frequent various depths from the surface downwards, and may be all well preserved in spirit."

1875. Barceló y Combis, Francisco.

Apuntes para la Fauna Balear. (Sesion del 3 de Febrevo de 1875.) Anales de la Sociedad Española de Historia Natural. Tomo cuarto. Madrid, 1875.

In the "Catálogo de los crustáceos marinos observados en las costas de las islas Baleares," at page 67 the "Hedrioftalmos" comprise two Amphipods, "*Orchestia* Leach. *O. Montagui* And. [Aud.]. *Pugó* en Mallorca!," and "*Gammarus* Fabr. *G. locusta* Fabr. Mallorca."

1875. Lockington, W. N. (see p. 443).

Observations on the genus Caprella, and Description of a New Species. Proceedings of the California Academy of Sciences. Volume V. 1873–1874. San Francisco, June 1875. pp. 404–406, pl. xi.

The new species is named *Caprella spinosa*. It was taken in Hakodadi Bay, Japan, and is thus described:—

"*Male.* Body very slender; segments elongate, second thoracic segment more than one-half longer than the first, and very slender. No spine on dorsal surface of head. Superior antennæ longer than half the body; first joint little more than half the length of second; third joint nearly as long as second; flagellum rather longer than basal joint. Inferior antennæ reaching to about the first third of the second joint of the superior antennæ. Hand of second pair of legs very narrow, with three teeth on the underside, one a short distance behind the claw, a second close to the first, and a third posterior to the middle. The third and fourth segments have a sharp spine on each side, above the branchiæ and near the hinder margin, and the three posterior segments are furnished with similar spines.

"Length of body, 1 11-16 inch. Length of superior antennæ, about 1 inch.

"*Female.* Body less elongated than in the male; third and fourth segments swollen at the sides, and both these segments armed with a long, sharp spine, the point curving towards the head; fifth and sixth segments armed with a straight spine. Second pair of legs about as long as the second segment of the body, the basal joint armed with a sharp spine on the upper side of distal end; hand shorter than basal joint, with a single acute tooth on the posterior third of the under side. Superior antennæ about half the length of the body, the second joint about one-third longer than the basal; flagellum as long as second joint. Inferior antennæ about equal in length to the first two joints of the superior antennæ.

"Length of body, about 1 7-16 inch; of superior antennæ, $\frac{3}{4}$ inch."

In the preliminary observations Mr. Lockington observes that "the male somewhat resembles the *C. attenuata* of Dana, the chief differences being the spines upon the five posterior segments, and the absence of the spine upon the head." He further says, "The females differ so greatly from the males in the comparative lengths of the several joints of the body and antennæ, that I was at first inclined to believe they belonged to another species; but since the two forms were always dredged in company, and the specimens of one form are all males while those of the other are all females, it is evident that they are the two sexes of the same species."

Already (p. 1259) I have suggested that Mr. Lockington's species might be the same as *Caprella scaura*, Templeton, of which Dana's *Caprella attenuata* is a synonym, and now that I have seen Mr. Lockington's descriptions and figures, little doubt remains in my mind that *Caprella spinosa* should be added to the synonymy of *Caprella scaura*. In regard, however, to the "long, sharp spine, the point curving towards the head," which Mr. Lockington figures on each side of the third and fourth segments of the female, it is reasonable to suspect some misapprehension, since, in regard to the branchial vesicles of these two segments in the *Caprellæ*, he says, "in the females these branchiæ are modified in form and function, becoming four broad plates," to form the marsupial sac. It is probable, therefore, that, as he considered the marsupial plates to be modified branchiæ, he regarded the actual branchiæ as spinous processes.

1875. LÜTKEN, CHR. FR.

The Crustacea of Greenland. *In* Manual of the Natural History, Geology, and Physics of Greenland and the neighbouring regions; prepared for the use of the Arctic Expedition of 1875, under the direction of the Arctic Committee of the Royal Society, and edited by Professor T. Rupert Jones, F.R.S. London, 1875. pp. 146–165.

It is stated that "this list is chiefly a revised copy of that given by Prof. Reinhardt in Rink's 'Greenland,' containing the corrections and additions published of late years." "The

synonyms given are principally taken from authors on Arctic or Scandinavian Zoology." For the Note on Reinhardt, 1857, see p. 301.

"Amphipoda (et Læmidopoda)," pp. 151–159, include the numbers 50 to 128, a note adding "Species dubiæ: *Oniscus arenarius*, F. Gr. 234; *O. Strœmianus*, F. Gr. 235 (*Gr.* Kingupek); et *O. abyssinus*, F. Gr. 236." The species are named as follows:—50. *Pontoporeia femorata*, Kr.; 51. *Opis typica*, Kr.; 52. *Lysianassa gryllus* (Mandt.); 53. *Socarnes Vahlii* (Rhdt.); 54. *Anonyx lagena* (Rhdt.); 55. *Anonyx gulosus* (Kr.); 56. *Aristias tumidus* (Kr.); 57. *Hippomedon abyssi* (Goës); 58. *Hippomedon Holbœlli* (Kr.); 59. *Orchomene minuta* (Kr.); 60. *Onisimus Edwardsii* (Kr.); 61. *O. plautus* (Kr.); 62. *Onisimus littoralis* (Kr.); 63. *Cyphocaris anonyx*, Ltk.; 64. *Stegocephalus ampulla* (Phipps); 65. *Metopa Bruzelii* (Goës); 66. *Metopa clypeata* (Kr.); 67. *Metopa glacialis* (Kr.); 68. *Syrrhoë crenulata*, Goës; 69. *Odius carinatus* (Sp. Bate); 70. *Vertumnus cristatus* (Owen); 71. *Vertumnus serratus* (Fabr.); 72. *Vertumnus inflatus* (Kr.); 73. *Paramphithoë glabra*, Boeck; 74. *Paramphithoë panopla* (Kr.); 75. *Paramphithoë bicuspis* (Rhdt.); 76. *Paramphithoë pulchella* (Kr.); 77. *Atylus carinatus* (Fabr.); 78. *Atylus Smitti* (Goës); 79. *Pontogeneia crenulata* (Rhdt.); 80. *Tritropis fragilis* (Goës); 81. *Tritropis aculeata* (Lepechin); 82. *Calliopius læviusculus* (Kr.); 83. *Amphithopsis longimana*, Bk.; 84. *Cleippides tricuspis* (Kr.); 85. *Halirages fulvocinatus* (Sars); 86. *Paramphithoë? megalops* (Buchh.); 87. *Acanthozone cuspidata* (Lep.); 88. *Œdicerus saginatus*, Kroyer; 89. *Œdicerus lynceus*, Sars; 90. *Œdicerus borealis*, Bk.; 91. *Monoculodes affinis* (Bruz.); 92. *Monoculodes norvegicus*, Boeck; 93. *Monoculodes latimanus* (Goës); 94. *Monoculodes borealis*, Bk.; 95. *Tiron acanthurus*, Lillj.; 96. *Harpina plumosa* (Kr.); 97. *Phoxus Holboelli*, Kr.; 98. *Haploöp tubicola* (Lilljeborg) (var.); 99. *Ampelisca Eschrichtii*, Kr.; 100. *Byblis Gaimardi* (Kr.); 101. *Pardalisca cuspidata*, Kr.; 102. *Eusirus cuspidatus*, Kr.; 103. *Melita dentata* (Kr.); 104. *Gammarus locusta* (Linn.); 105. *Gammaracanthus loricatus* (Sabine); 106. *Amathilla Sabini* (Leach); 107. *Amathilla pinguis* (Kr.); 108. *Autonoë macronyx* (Lilljeb.); 109. *Protomedeia fasciata*, Kr.; 110. *Photis Reinhardti*, Kr.; 111. *Podocerus anguipes* (Kr.); 112. *Podocerus latipes* (Kr.); 113. *Siphonocoetes typicus*, Kr.; 114. *Glauconome leucopis*, Kr.; 115. *Themisto libellula* (Mandt); 116. *Th. bispinosa*, Boeck; 117. *Parathemisto compressa* (Goës); 118. *Hyperia medusarum* (Müll.); 119. *Tauria medusarum* (Fabr.); 120. *Dulichia spinosissima*, Kr.; 121. *Caprella septentrionalis*, Kr.; 122. *Cercops Holboelli*, Kr.; 123. *Ægina longicornis*, Kr.; 124. *Æ. echinata*, Boeck; 125. *Cyamus mysticeti*, Ltk.; 126. *Cyamus boopis*, Ltk.; 127. *Cyamus monodontis*, Ltk.; 128. *Cyamus nodosus*, Ltk.

The synonymy of "*Acanthozone cuspidata* (Lep.)" is followed by the note "*Obs.*—*Amphithoë Jurinii?*, Kröy., Bell, l. c., p. 406. I am not aware that Prof. Kröyer ever described a species of that name."

To the synonymy of "*Hyperia medusarum* (Müll.)" is appended a footnote, "As *Hyperoödon rostratus* and *Globiocephalus melas* are occasionally seen in Baffin's Bay, their parasites (*Platycyamus Thompsoni*, *Pennella crassicornis*, *Xenobalanus gl.*, and *Cyamus globicipitis*) might also be enumerated among the Crustacea of Greenland; but they are omitted here because they have not actually been sent down from Greenland."

To "*Cyamus nodosus*, Ltk." is appended a footnote, "Quid est *Talitrus cyaneæ*, Sabine, Suppl. App. Parry's Voy., t. I., f. 12–18?"

It may be remarked, in reference to these notes, that "*Amphitoë Jurinei*, Milne-Edwards," is by Spence Bate made a synonym of *Pherusa fucicola*, Leach; that *Pennella* and *Xenobalanus* are only mentioned incidentally, not with any intention of including them among the Amphipoda; that to the question "quid est *Talitrus cyaneæ*, Sabine," the answer given by Boeck and Bovallius seems reasonable that it is a synonym of *Hyperia medusarum* (Müller).

"*Paramphithoë bicuspis* (Rhdt.)" has for its synonyms *Amphithoe bicuspis*, Kr., *Paramphithoë*

bicuspis, Bruzel., *Pherusa bicuspis*, Sp. Bate, and *Pherusa cirrus*, Sp. Bate; but Mr. A. O. Walker has called my attention to the circumstance, which I take this opportunity of mentioning, that *Pherusa bicuspis*, Sp. Bate, is clearly a distinct species from Krøyer's *Amphithoë bicuspis*.

The Manual also contains separate lists of Amphipods under the following headings:—

Page 503. "Marine Invertebrata of the Parry Islands, &c. By Sabine, Kirby, J. C. Ross, Fleming, Leach, and R. Owen, 1824, 25, 26; 1819; 1835." In a footnote to this contribution a reference is given to a mention of "*Gammarus Sabini*" by Dr. Wallich, in "The North-Atlantic Sea-bed," Part. I. p. 79 (London, 1862).

Page 508. "Arctic Crustacea and Pycnogonida, collected by the English Expeditions. By Dr. Walker, 1860."

Page 512. "The Results of some Dredgings made at Goodhaab, West Greenland, by Dr. G. C. Wallich in 1860. 'The North-Atlantic Sea-bed,' &c., by G. C. Wallich, M.D., F.L.S., F.G.S., 1862 (4to, London), p. 102." "*Gammarus arcticus*" and "*Caprella linearis* (on Algæ)" are the only Amphipods mentioned.

Page 561. "The Crustacea of E. Greenland. By Dr. R. Buchholz, 1874."

These lists, with the exception of Dr. Wallich's, have been already discussed in earlier Notes on the works from which they are drawn.

1880. Stossich, Michele.

Prospetto della Fauna del Mare Adriatico. Parte III. Crustacea. Bolletino della Società Adriatica di Scienze Naturali in Trieste. Volume sesto. Trieste, 1880. pp. 178–271.

In this Catalogue the Amphipoda extend from page 230 to page 247. The suborder Læmodipoda contains the family Caprellidæ, with one genus, *Caprella*, to which are assigned eight species. The suborder Crevettina contains the family Cheluridæ, with one genus and species; fam. Corophiidæ, with the subfam. Corophiinæ, in which *Corophium* has two species, *Cyrtophium* one, *Cratippus* two, *Icridium* one; subfam. Podocerinæ, in which *Microdeutopus* has two species, *Cerapus* two, *Podocerus* five, *Amphitoë* four; fam. Orchestiidæ, in which *Talitrus* has one species, *Orchestia* four, *Allorchestes* three, *Nicea* eleven; fam. Gammaridæ, with the subfam. Atylinæ in which *Atylus* has one species, *Protomedeia* three, *Pherusa* one, *Dexamine* five, *Iphimedia* two, *Isæa* one, *Ampelisca* one, *Kroyera* one; subfam. Leucothoinæ, in which *Eusirus* has one species, *Leucothoë* one; subfam. Gammarinæ, in which *Gammarus* has six species, *Melita* three, *Mæra* seven, *Eurystheus* one, *Anathilla* one; subfam. Lysianassinæ, in which *Lysianassa* has seven species, *Probolium* two, *Ichnopus* two, *Anonyx* seven, *Callisoma* one. In all a hundred and one species are given, with synonyms, references to authorities, and localities. Stalio's Catalogue (1877) is quoted for almost every species.

1881. Exner, Sigmund.

The Mode of Action of Facetted Eyes. Popular Science Review, Vol. XX. 1881. p. 337. *From* Biologisches Centralblatt, Jahrg. I. p. 272, 1881.

1881. Rathbun, Richard.

The littoral marine Fauna of Provincetown, Cape Cod, Massachusetts. Proceedings of the United States National Museum. Vol. III. 1880. Washington, 1881. pp. 116–133.

It is stated that the Amphipods have been identified by Professor S. I. Smith. They are named as follows on pages 120, 121; "*Orchestia agilis* Smith"; "*Talorchestia longicornis* (Say) Smith"; "*Talorchestia megalopthalma* (Bate) Smith"; "*Hyale littoralis* (Stimp.) Smith"; "*Calliopius lævisculus* (Kroy.) Boeck"; "*Gammarus locusta* (Linné) Fabr.,' with a reference to "Gould, Inv. Mass., ed. I. p. 334, 1841," and the synonym "*G. ornatus* Edwards, Ann. des Sci. Nat., tome xx. p. 367, 1830"; "*Gammarus annulatus* Smith"; "*Gammarus mucronatus* Say"; "*Mœra levis* Smith"; "*Microdeutopus grandimanus* Smith," with the synonyms "*Autonoë grandimana* Bruz., Skand. Amphip. Gamm., p. 26, 1859.—*Microdeutopus minax* Smith, Inv. V. S., p. 562, 1874"; "*Amphithoë longimana* Smith"; "*Corophium cylindricum* (Say) Smith"; "*Chelura terebrans* Philippi"; "*Caprella geometrica* Say." A few short notes are given in regard to localities, and the statement is made that "a comparison of European with American specimens has enabled Professor Smith to establish the identity of *G. ornatus* and *G. locusta*." *Autonoë grandimana*, Bruzelius, had been already named *Microdeutopus grandimanus* by Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 378.

1881. Thomson, George Malcolm, born October 2, 1848 (G. M. T.).

Recent Additions to and Notes on New Zealand Crustacea. [*Read before the Otago Institute*, 11th *May*, 1880.] Transactions of the New Zealand Institute, Vol. XIII. pp. 204–221. Pls. VII., VIII.

A discussion on the genus *Orchestia* leads up to the conclusion that the New Zealand species of that genus thus far known are only five, *Orchestia aucklandiæ*, Sp. Bate, *Orchestia telluris*, Sp. Bate, *Orchestia chilensis*, M.-Edw., *Orchestia serrulata*, Dana, and *Orchestia sylvicola*, Dana. The last species is regarded as including *Orchestia novæ-zealandiæ*, Sp. Bate, and *Orchestia tenuis*, Dana. The terminal part of a second gnathopod is figured. From the examination of 163 specimens, Mr. Thomson is "strongly of opinion that they all belong to one variable species, the males of which have at least two forms of gnathopoda, and the females of which differ considerably in those very characters which have hitherto had specific importance attached to them." It is "a strictly terrestrial form."

The other species discussed in this paper have been already mentioned in the Notes on Thomson, 1879 (p. 500) and 1880 (p. 524).

On Plate vii., fig. 5A. is the head, 5B. a gnathopod, of *Amphilochus squamosus*, Thomson; fig. 6. is *Amphithonotus levis*, Thomson. On Plate viii., fig. 7A. represents the antennæ, 7B. a mandible, 7C. the telson and third uropods of "*Microdentopus maculatus*," Thomson; fig. 8. is "*Cyrtophium cristatum*," Thomson; fig. 9. is "*Corophium contractum*, Stimpson."

1882. Bellesme, Jousset de.

Sur les anastomoses des fibres musculaires striées chez les Invertébrés. *In* Compt. rend., Tome 95. pp. 1003, 1004.

"Jousset de Bellesme verbreitet sich über die bereits bekannten Anastomosen der Musculatur an den 'glandes gastriques' (Hepatopancreas) der Amphi- und Isopoden (vergl. Bericht f. 1880. II. p. 12)." P. Mayer in Zool. Jahresbericht für 1882.

1882. Costa, Achille.

Rapporto preliminare e sommario sulle ricerche zoologiche fatte in Sardegna durante la primavera del 1882. (Adunanza del dì 14 Ottobre 1882.) Rendiconto dell' Accademia delle Scienze fisiche e matematiche. Anno XXI. Napoli, 1882. pp. 189–201.

The only remark upon Amphipoda is, at page 193, that to genera previously collected there are added some species of *Gammarus*, still awaiting examination.

1882. Thomson, G. M.

Additions to the Crustacean Fauna of New Zealand. [*Read before the Otago Institute, 22nd November*, 1881.] Transactions of the New Zealand Institute, Vol. XIV. pp. 230–238. Pls. XVII., XVIII.

Prior to describing *Anonyx corpulentus*, n. sp., pl. xvii. figs. 1*a–f*, Mr. Thomson remarks that the characters on which the genus *Anonyx* "is separated from *Lysianassa* are very insufficient, being mainly subchelate nature of the first pair of gnathopoda, and secondly the cleft telson." The new species, he says, "is an *Anonyx* in all respects, except that its telson is entire, which is the case also with *A. plautus*, Kröyer, an European species." *Anonyx plautus* is transferred by Boeck to *Onisimus*. "*Anonyx exiguus*," Stimpson, is described and partly figured, pl. xviii. figs. 2*a–e*. *Phoxus batei*, Haswell, is described and partly figured, pl. xvii. figs. 2*a–e*. This species appears to come near to *Phoxus bassi*, n. sp., of this Report, but to be distinguished from it by the differently shaped first joint of the fifth peræopods, the more unequal rami of the third uropods, and the shorter telson; the differences in the antennæ are probably due only to age or sex, and the very considerable difference between the second gnathopods of the two forms is not necessarily specific. *Polycheria obtusa*, n. sp., pl. xvii. figs. 3*a–d*, is in my opinion, as elsewhere stated, a synonym of *Tritæta antarctica*, Stebbing. *Leucothoë traillii*, n. sp., pl. xviii. figs. 1*a–d*, is described. Three varieties of Dana's Fiji species, *Gammarus quadrimanus*, are noticed under the name "*Moera quadrimanus*, Sp. Bate," with figures of the second gnathopod of two of the forms, pl. xvii. figs. 4*a*, 4*b*. *Moera petriei*, n. sp., pl. xviii. figs. 3*a–c*, is described, a species afterwards identified by Mr. Chilton with *Megamoera sub-carinata*, Haswell, and in this Report transferred to the genus *Elasmopus*, Costa, see p. 1024. In the family Corophiidæ, the new genus *Iphigenia* is thus described:—

"Body much depressed and flattened. Antennæ short and thick, subequal. Coxæ of the first four segments of the pereion very large, those of the succeeding segments small. Basa of the three pairs of posterior pereiopoda dilated. Gnathopoda simple, unguiculate. Three posterior pairs of pleopoda very small, curved inwards, with minute simple rami. Telson single, entire.

"The very remarkable Crustacean (Amphipod) for which this genus has been formed, appears on first inspection to be an Isopod. It is only after closer examination that it is seen to be allied to *Icillius* [*Icilius*], Dana, one of the most anomalous forms of the Corophiides. From this genus it is, however, at once distinguished by the very large coxæ of the four anterior segments of the pereion, and by its short, thick, subequal antennæ."

The type species, *Iphigenia typica*, n. sp., is described and figured, pl. xviii. figs. 4*a–g*. As already pointed out by Dr. v. Martens, the name *Iphigenia* is preoccupied and requires to be changed. In many respects this curious little species seems to approach the equally curious little *Phlias serratus* of Guérin, but while the latter is laterally much compressed,

the former is strikingly flattened out; on the other hand, *Pereionotus testudo* (Montagu) and *Icridium fuscum*, Grube, which come very near to Guérin's species, agree with *Iphigenia typica* in having the depressed Isopod-like body; the maxillipeds of *Icridium fuscum* are said to have a three-jointed palp, agreeing in this respect with the maxillipeds figured by Mr. Thomson for his species, but not agreeing with a specimen of *Iphigenia typica* sent me by Mr. Chilton, in which the maxilliped-palps are four-jointed; the mandibles in this specimen agree with those which Grube describes, in having four teeth to the cutting edge and no visible palp; in regard to the pleon Grube's species is very distinct from Thomson's; until, however, the mouth organs of the genera referred to have been more fully described and figured, and the anomalous character of the pleon in Grube's *Icridium* has been either established or disproved, the relation of these remarkable forms to one another must remain very uncertain.

1883. Graeffe, Ed.

Biologische Notizen über Seethiere der Adria. Ueber die Fauna der Schlammregion der Adria. Bolletino della Società adriatica di scienze naturali in Trieste. Volume ottavo. Trieste, 1883. pp. 85–89.

The two species of Amphipods recorded from this mud-region are "*Ampelisca Gaimardi* Kroyer," and "*Phoxus plumosus* Kroyer." Professor Graeffe regards these two species as strongly supporting his view that the mud-dwellers have suffered degradation of the visual organs owing to the character of their habitat.

"The Crevettines or Gammaridæ," he says, "to which division these Amphipods belong, generally exhibit sessile eyes, that is, the pair of eyes is situated wholly in the cephalothorax. A part of the chitin-layer of this is bulged out, and provided with facets, which are more or less clearly developed. Behind this facetted corneal-surface there is a pigment-layer, which envelops the elements of the arthropod-eye, crystal-cone, and rhabdom-layer of the retina. The optic-nerves which provide for this eye, are derived from a special cerebral-knot or ganglion.

"In *Ampelisca* this corneal-part of the eye is only provided with two facets, which points to an arrested development of it, as these facets, to which the refracting and sentient retina-rods correspond in number are multiplied with the development, the growth of the animal. In *Ampelisca Gaimardi*, moreover, the pigment of the eye is little developed, so that one may well maintain that this species possesses a degraded pair of eyes.

"In *Phoxus plumosus* this degradation has advanced still further, since here no corneal part whatever is to be seen, and in the place of the eye there is only a faint yellowish pigment-fleck remaining. This species is to be reckoned among the totally blind animals."

On the subject of the eyes in *Ampelisca*, see Note on Della Valle, 1888 (p. 1651).

1883. Herrmann, G.

Sur la spermatogénèse chez les Crustacés édriophthalmes. *In* Compt. Rend. Tome 97. pp. 1008–1012. *Also in* Journ. Micr. Paris. Année 7. pp. 588–590.

According to this author "verläuft die Spermatogenese bei *Ligia*, *Idotea*, *Sphæroma*, *Gammarus*, *Talitrus* in ganz anderer Art als bei den Podophthalmen und erinnert bis auf das sehr frühe Verschwinden des 'nodule céphalique' in auffallender Weise an die der Selachier. Das Spermatozoid bleibt unbeweglich (vergl. Bericht f. 1879. p. 418 u. 1882. II. p. 21)." Zool. Jahresbericht für 1883.

1883. Mayer, Paul, und Giesbrecht, Wilhelm.

Zoologischer Jahresbericht für 1882. II. Abtheilung. Leipzig, 1883. Crustacea, pp. 4–63.

1884. Giesbrecht, W.

Zoologischer Jahresbericht für 1883. II. Abtheilung. Leipzig, 1884. Crustacea, pp. 9-50.

1884. Möbius, Karl.

Nachtrag zu dem im Jahre 1873 erschienenen Verzeichniss der wirbellosen Thiere der Ostsee. *In* 4. Ber. Comm. Unt. d. Meere Kiel. 7.–11. Jahrg. 3. Abth. pp. 61–70.

The Gammaridæ mentioned are (on p. 68), *Pontoporeia furcigera*, Bruz., "7 m. tief, todtes Seegras"; *Bathyporeia pilosa*, Lindström; "*Dexamine spinosa*, Montag."; *Cheirocratus brevicornis*, Hoek, "10–14 m. tief"; and (on p. 69), *Protomedeia pilosa*, Zadd.; *Microdeutopus gryllotalpa*, Costa, "in geringen Tiefen zwischen Miesmuscheln"; *Amphithoë podoceroides*, Rathke; *Podocerus falcatus*, Mont., "stoller Grund, 18 m. tief."

1884. Thomson, G. M.

Descriptions of new Crustaceans. [Read before the Otago Institute, 31st October, 1882.] Transactions and Proceedings of the New Zealand Institute, 1883. Vol. XVI. Issued May, 1884. Wellington. pp. 234–240, Pls. XII., XIII.

"*Allorchestes recens*, n. sp. Pl. xiii., figs. 2–5," is described, and of the locality Mr. Thomson says, "Numerous specimens of this species were sent me from Wellington by Mr. J. C. Gully, who obtained them in a small stream into which several drains ran."

"*Corophium excavatum*, n. sp., Pl. xii., figs. 1–8," is described, from "Brighton Creek (salt water), near Dunedin," and the remark added, "This species is very distinct from any hitherto described, the form of the meros [third joint] of the 2nd gnathopod being quite remarkable; a tendency towards a similar development of structure occurs apparently in *C. longicorne*, which is, however, a very different species in many respects." The third uropods are represented with two rami, "internal ramus very minute." This feature is inconsistent with the definition of the genus *Corophium* by Spence Bate and of the family Corophidæ by Boeck, according to which the third uropods are uniramous.

A definition of the genus *Oxycephalus* is followed by descriptions of the two sexes of "*Oxycephalus edwardsii*, n. sp. Plate xii., figs. 14–21; pl. xiii., fig. 1." Of this species Mr. Thomson says, "I found numerous individuals washed up on the Ocean Beach near Dunedin on two different occasions: they appear to come ashore in fine clear calm weather." The approximation of this species to the form designated in this Report as *Oxycephalus clausi*, Bovallius, has been already noticed (pp. 1582, 1585). Mr. Thomson says of the maxillipeds, that they "are of very simple structure, consisting each of an oval smooth plate, without any trace of hairs or teeth," but the specimens which he has very kindly sent me show that

these minute organs are of the form usual in the genus and indeed in the whole group, having a small inner plate between the two outer plates, the latter having the outer margin convex and the inner sinuous.

1885. Kerville, H. Gadeau de.

Aperçu de la Faune actuelle de la Seine et de son embouchure depuis Rouen jusqu'au Havre. *In* L'Estuaire de la Seine, par G. Lennier. Le Havre, 1885. Tome 2. pp. 181–182. (É. Chevreux.)

See Note on Gadeau de Kerville, 1886 (p. 583).

1886. Brook, G., and Calderwood, W. L.

Report on the Food of the Herring. Appendix to Fourth Annual Report of the Fishery Board for Scotland. Edinburgh, 1886. pp. 102–128.

In allusion to this Appendix the Introduction to the Report states (p. xix) that "during winter and spring herring feed chiefly on *Hyperia Galba*, *Nyctiphanes norvegica*, and *Sagitta*."

In regard to *Hyperia galba* the Appendix itself says, "This species must be reckoned as one of the most important forms of herring food. Judging from its frequency in the stomach of the herring, this form must exist in myriads off the east coast of Scotland. The male is smaller than the female and leads an active pelagic existence. In structure it is so different that it has been described as a distinct genus (*Lestrigonus*). The males occur in much greater abundance than the females in the stomachs which we have examined, an occurrence which is doubtless to be attributed to the difference in habit of the two sexes. The female occurs plentifully in the summer time under the umbrella of *Aurelia*, *Rhizostoma*, and other Medusæ. We are not, however, acquainted with its habit during the colder months, that is during the period in which it is found as herring food." In the notes on the distribution of the species it is stated that "the statistics given for the area between Peterhead and Cromarty appear to show that *Hyperia* is frequent in that part in December, more abundant in January, while in February and March the supply gradually diminishes and the herring then seeks other food. A careful comparison, however, shows that so far as our material goes, *Hyperia* is by no means so abundant in this area as in those to the south of it." "This species," the authors say, does not "appear to form such an important part of the herring's food in the Wick district at any time, as it does in the waters south of Peterhead." They are also "of opinion that *Hyperia* cannot be a common form on the west coast."

Since the authors speak of *Hyperia* as a species, it may be presumed that they did not intend to lay any special stress on the specific name *Hyperia galba*, which has so long exercised and still continues to exercise the minds of writers on the synonymy of the Amphipoda. Indeed the herrings must be delicately sensitive in the matter of taste if they can discriminate the various closely connected species of the family Hyperidæ, let alone those of the genus *Hyperia*. The opinion of Thomas Edward as to the stay of *Hyperia galba* and *Hyperia oblivia* respectively at Banff, may be seen in the Note on that author, p. 382. Unless, however, some distinguishing marks are given, it is of little use to argue about the distribution of species, since authors may be referring to different species under the same name, or to the same species under different names. No great stress should, I think, be laid on the negative evidence regarding the occurrence of *Hyperiæ* on the west coast of Scotland, but it is corroborated by Mr. David Robertson's experience with regard to "*Parathemisto oblivia*," recorded in his Catalogue of the Amphipoda of the Clyde, 1888.

"With reference to the food of the east coast herring," the authors say, "it may be stated generally that the relative frequency of *Hyperia* and [the Schizopod] *Nyctiphanes* depends on the month during which the fish were captured. *Hyperia* is extremely abundant during January and February, and the stock then gradually diminishes, or at any rate the herring do not feed on this form to such a great extent after that time." But as the *Hyperiæ* become rare, the stock of *Nyctiphanes* increases. "The quantity of the one appears to be inversely proportional to that of the other."

1887. Bonnier, Jules, born August 31, 1859 (J. B.).

Catalogue des Crustacés Malacostracés recueillis dans la baie de Concarneau. Paris, 1887. Extrait du Bulletin scientifique du Département du Nord publié sous la direction de M. Alfred Giard. 2me série.—Xme année.—1887.

The Amphipoda occupy pages 67–127 (pp. 296–356 of the Bulletin itself),[1] and a part of pages 189, 190. The "Index bibliographique des ouvrages cités" extends from page 167 to page 184. In the classification of the Amphipoda Boeck's latest work is followed; no new species are recorded or described; some brief notes are given on some of the known species, of which sixty-four are enumerated, with an elaborate synonymy, the discussion of which would involve too much repetition of remarks already made in earlier notices.

1887–1888. Bovallius, C.

Contributions to a monograph of the Amphipoda Hyperiidea. Part I. Division 4: The families Tyronidæ, Lanceolidæ, and Vibilidæ (with 10 Plates). Svenska Vetenskaps-Akadamiens Handlingar. Ny Fjöld. Band 21: 1884 och 1885. Häftet I. Stockholm 1887 (auf dem Titel 1884).

For the preliminary notice, see Note on Bovallius, 1887 (p. 587). The present instalment of Bovallius' larger work has not yet come into my hands. The title is quoted from Friedländer's Naturæ Novitates for June 1888.

1887. Chevreux, E.

Crustacés Amphipodes nouveaux dragués par l'*Hirondelle*, pendant sa campagne de 1886. Extrait du Bulletin de la Société Zoologique de France, t. xii. 1887. Paris, 1887. 15 pages.

Off Cape Finistère, at a depth of 510 mètres, the Hirondelle obtained specimens of "*Nicippe tumida* Bruz.," "*Ampelisca anomala* G. O. Sars," and "*Urothoe abbreviata* G. O. Sars," and the following new species, of which descriptions are given—(1) *Opis hispana*, (2) *Harpinia excavata*, (3) *Amphithopsis grandimana*, (4) *Tritropis Grimaldii*, (5) *Ampelisca uncinata*, (6) *Ampelisca spinimana*, (7) *Byblis Guernei*, (8) *Podoceropsis abyssi*. Of these the species numbered 1, 2, 5, and 8 are said to be without eyes. *Opis hispana* should be called *Opisa hispana*, the preoccupied *Opis* having been changed by Boeck, and *Tritropis grimaldii* should be called *Rhachotropis grimaldii*, S. I. Smith having substituted *Rhachotropis* for the preoccupied *Tritropis*. In *Podoceropsis abyssi* there is a rudimentary secondary

[1] Juillet-aout 1887.

flagellum to the upper antennæ, and M. Chevreux says that he has always found one in the different forms of the genus *Podoceropsis* which he has had occasion to examine; on this subject I may refer to what is said on p. 1108, in confirmation of M. Chevreux's remark.

Lists are given of the species of Amphipods obtained at various stations off the west coasts of France and Spain, and among others M. Chevreux notices that "*Melita gladiosa* Sp. Bate" and "*Gammaropsis erythrophthalma* Lillj." were obtained from a depth of 250 mètres.

1887. Giles, G. M.

On Six new Amphipods from the Bay of Bengal. Natural History Notes from H.M.'s Indian Marine Survey Steamer "Investigator." No. 6. [*Reprinted from the Journal of the Asiatic Society of Bengal, Vol. LVI. Part II. No.* 2, 1887.] [Received and Read March 2nd, 1887.] pp. 212–229. Plates III.–VIII.

The first section of the paper is headed, "*A Description of two new Species of the Amphipod Family* Phronimidæ *with some Remarks on the Genera of the Family.*" In stating that the finger of the third peræopod in *Phronima* is not, as Spence Bate supposed, either fused with the preceding joint or obsolete, Mr. Giles is, I think, quite right. He describes and figures (pl. iii. figs. 1 and 2), a new species, *Phronima bucephala*, which, he says, "differs from the genus as defined by Claus in the following points:—1st., in my one female specimen, I can make out no trace whatever of inferior antennæ; 2nd., the subchela of the '5th' (6th) thoracic appendage [third peræopod] cannot be said to be slender, the fixed ramus being very stout and almost quadrate; 3rd., there are two extra small gill-sacs on the 2nd and 3rd thoracic segments, a character extremely abnormal, but of the reality of which I carefully satisfied myself. To avoid, however, the necessity of manufacturing a new genus, I describe it as a member of the genus *Phronima*, as defined by Spence Bate, under the name of *P. bucephala.*"

There is certainly no need for a new genus; the specimen is a small one, "5·75 mm." in total length, so that the failure to discover the lower antennæ can be easily understood; the objection that the grasping part of the third peræopods cannot be said to be slender rests on an accidental misreading of Claus' generic definition, which states that this part is powerful (mit mächtiger Scheerenhand), not slender (schmächtig in the previous line referring to the gnathopods); lastly, the two extra pairs of gill-sacs are probably not gill-sacs but marsupial plates in process of development, at least I have never met with them except in small specimens of *Phronima*. The telson in this genus is as a rule so difficult to observe, that too much stress must not be laid on the remark in the specific description, "the *telson* appears obsolete." The fourth joint of the third peræopod is thus described—"The carpopodite is triangular, its inferior border being nearly as long as the lateral. The antero-inferior angle is prolonged into a powerful spine, and the inferior border is armed with three dentations, between which are a corresponding number of small, isolated tufts of hair." According to the figure, however, the antero-inferior spine is not very strong compared with what is found in adult specimens of the female in this genus. In the "Explanation of the Plates" the specimen by a misprint is said to be a male.

The second species described and figured (pl. iii. fig. 3) is named *Phronimella hippocephala*, n. sp., which appears from the antennæ to be a young male, but whether it is distinct from species already described it may be difficult to decide. The first peræopods are as usual much longer than the second, and this peculiarity made Mr. Giles hesitate whether he could include his species in the genus *Phronimella*. Claus, unfortunately, in Der Organismus der

Phronimiden, on which Mr. Giles has relied, repeats the erroneous statement which he had already himself corrected, that the second peræopods are longer than the first.

The third species, "*Rhabdosoma investigatoris*, n. sp. Pl. IV.," is briefly compared with the descriptions of *Rhabdosoma armatum*. Whether the species here discussed is really new may need some further enquiry. It is said that two specimens were obtained, one male and the other female, "the latter being that shown in the figure." Mr. Giles remarks that "It is probably an adult, as the broad pouch, although empty, is well-marked and of considerable size." The figure, however, shows the characteristic upper and lower antennæ of the male, as well as the long mandibular palp of that sex. Since the specimens were respectively only an inch and half an inch long, the small differences from Claus' figure and description of *Rhabdosoma armatum*, ♂, may be accounted for by individual variation or difference in age. Mr. Giles considers that Claus has proved the specific identity of *Rhabdosoma armatum* (Milne-Edwards) and *Rhabdosoma whitei*, Spence Bate.

The fourth species, "*Amphipronoë longicornuta*, n. sp., Pl. V.," is called in the "Explanation of the Plates" *Amphipronoë longicornutus*. It is said that "the animal agrees well with all the characteristics of the genus as given in Spence Bate, though the 8th thoracic appendage [fifth peræopods] would perhaps be better described as stunted than as rudimentary." The difficulty connected with the genus *Amphipronoë* is here overlooked, for in the definition of that genus Spence Bate includes the character, "First pair of gnathopoda complexly subchelate; second pair not subchelate," whereas in the new species the two pairs of gnathopods "closely resemble each other" and "they are provided with a curious complex subchela." The species clearly belongs to the genus *Lycæa*, Dana, as interpreted by Claus. The muscles of the antennæ and gnathopods are here discussed by a competent observer.

The fifth species "*Lestrigonus bengalensis*, n. sp., Pls. VI. & VII.," is referred to *Lestrigonus*, not on the ground that *Lestrigonus* is distinct from *Hyperia*, but on the supposition apparently that it is the older name. The new species is extremely small, males with antennæ indicating the adult stage being only 2·5 mm. long. It bears some resemblance to *Hyperia dysschistus* of this Report, but is distinguished from it by the telson and uropods.

The sixth species "*Eurystheus hirsutus*, n. sp., Pl. VIII.," should perhaps rather be named *Gammaropsis hirsutus*. The side-plates as figured are remarkably shallow.

1887. GUERNE, J. DE.

Sur la faune des îles de Fayal et de San Miguel (Açores). Comptes Rendus Hebdomadaires des séances de l'Académie des Sciences. Tome CV. No. 17 (24 October 1887). Paris, 1887. pp. 764–767.

Allusion is made to the Amphipod soon afterwards named *Orchestia chevreuxi*, found in the Caldeira of Fayal.

1887. GUERNE, J. DE.

Notes sur la faune des Açores: Diagnoses d'un Mollusque, d'un Rotifère et de trois Crustacés nouveaux. Le Naturaliste. Revue illustrée des Sciences Naturelles. Paris, 1887. (Extract, 7 pages.)

Orchestia chevreuxi, nov. sp. is thus described;—"*Femina*. Antennæ superiores paulo ultra articulum pedunculi penultimum antennarum inferiorum porrectæ. Pedes secundi paris articulo quarto aculeis duobus armato; carpo elongato. Pedes quarti paris perbreves

Telson breve, ovatum, emarginatum. *Mas ignotus.* Longit. 15 mm. *Localité.* Cratère de Fayal, 16 juillet 1887." Compare Note on Barrois, 1888 (p. 1648), and Note on de Guerne, 1888 (p. 1652).

M. de Guerne observes that while the species of *Orchestia* from the sea-shore are numerous, the only species hitherto known under conditions like those of *Orchestia chevreuxi* is *Orchestia tahitensis*, Dana, found on an extinct volcano in Tahiti, several miles from the sea and 500 mètres above its level; for a correction of this statement see Note on Barrois, p. 1649.

1887. HANSEN, H. J.

Malacostraca marina Groenlandiæ occidentalis. Oversigt over det vestlige Grønlands Fauna af malakostrake Havskrebsdyr. Særtryk af "Vidensk. Meddel. fra den naturh. Foren. i Kjøbh. 1887." Kjøbenhavn, 1887.

Besides various notices in the introductory part of this valuable work, the Amphipoda occupy pages 55 to 177, pages 217 to 222, and pages 225, 226. Plates II. to VI. are concerned with this group. A hundred and fifty-one species are named, some with corrected synonymy, some with notes of locality, and some with more or less full discussion, the new species being described in Latin and in general figured. The new species are named—*Aristias neglectus* (Tab. II. fig. 4) on which see below; *Anonyx groenlandicus* (Tab. II. figs. 5–5*g*); *Tryphosa pulchra* (Tab. II. figs. 6–6*e*); *Prinassus Nordenskiöldii* (Tab. II. figs. 7–7*f*, Tab. III. figs. 1–1*c*); *Amphilochus oculatus* (Tab. III. figs. 2–2*c*); *Metopa latimana*, of which however Dr. Hansen begins his description by saying "Specimen singulum vix adultum vidi.—*Met. affini* Boeck valde similis, structura pedum primi et secundi parium diversa," *Metopa groenlandica* (Tab. III. figs. 7–7*e*); *Metopa neglecta* (Tab. III. figs. 9–9*b*), with the synonymy "*Metopa longimana* Boeck Skand. og Arkt. Amph. Pl. XVII. figs. 5–5*n* (figura 6 et descriptio ad *Met. longimanam* pertinent)"; *Metopa carinata* (Tab. IV. figs. 3–3*e*); *Oediceros curvirostris* (Tab. IV. fig. 4) with the synonymy "*Oediceros lynceus* Boeck, Skand. og Arkt. Am. Pl. XIII. fig. 4 (Descriptio ad *Oed. lynceum* pertinet)"; *Monoculodes crassirostris* (Tab. IV. figs. 5–5*f*); *Monoculodes simplex* (Tab. IV. figs. 6–6*h*); *Halimedon obtusifrons* (Tab. V. figs. 1–1*e*); *Aceros distinguendus* (Tab. IV. fig. 8) with the synonymy "*Oediceros obtusus*, 'alia forma, Goës, Op. cit. p. 527, Tafl. XL. fig. 24"; *Paramphithoë Boeckii* (Tab. V. figs. 3–3*b*) with the synonymy "*Pleustes pulchellus* Boeck, Skand. og Arkt. Amph., Pl. XXIII. fig. 1 (Descriptio ad *Par. pulchellam* referenda est)"; "*Amphithopsis Olrikii*" (Tab. V. figs. 5–5*b*); *Amphithopsis glacialis* (Tab. V. figs. 6–6*c*); *Tritropis oculata* (Tab. V. figs. 7–7*e*), the description of which is followed by the observation, "Hæc species nova a speciebus ceteris affinibus hujus generis imprimis differt oculis permagnis superne valde inter se approximatis, antennarum primi paris articulo basali perlato quam articulo secundo longiore, articulo tertio perbrevi, pedum septimi paris articulo secundo perpaulo longiore quam atiore"; *Melita amoena* (Tab. VI. figs. 1, 1*a*); *Podoceropsis Lindahlii* (Tab. VI. figs. 2, 2*a*); *Podocerus nanoides* (Tab. VI. figs. 4–4*b*); *Unciola crassipes* (Tab. VI. figs. 6, 6*a*); *Unciola laticornis* (Tab. VI. figs. 7–7*b*). There is also a named variety, "*Caprella microtuberculata* G. O. Sars, var. *spinigera*."

The new genus *Prinassus* is launched without distinction between the generic characters and those of the type-species, except that the author says, "this new and interesting form shows in the shape of the antennæ and limbs and in the coalescence of the fifth and sixth segments of the pleon so much difference from its nearest relations, *Pontoporeia* and *Priscilla*, that I have been forced to institute a new genus for it." The mouth organs are not described. The antennæ (in the female) are short, with no accessory flagellum; the gnathopods are

subchelate, the hand not longer than the wrist; in the first and second peræopods the fourth joint is much shorter than the third; the third peræopods are longer than the fourth, and the fourth than the fifth; in the fifth the first joint is very large and the third and fourth joints are strongly plumose; the telson is rather longer than broad, cleft almost to the base. The name of the type-species is variously given as Nordenskiöldii, Nordenskiøldii, and Nordenskjöldii.

To *Hyperia latreillei*, Milne-Edwards, the synonyms given are *Lestrigonus exulans*, Krøyer, *?? Hyperia oblivia*, Krøyer, *?? Hyperia medusarum*, Boeck, *?? Hyperia latreillei*, Bovallius, *?? Parathemisto oblivia*, Bovallius; to "*Hyperoche medusarum* (Krøyer)" the synonyms are *Metoecus medusarum*, Krøyer, *Tauria medusarum*, Boeck, "*Hyperoche Kroeyeri*," Bovallius, "*Hyperoche Luetkeni*," Bovallius; *Parathemisto compressa*, Boeck, and *Themisto bispinosa*, Boeck, are both assigned to *Euthemisto compressa* (Goës); "*Euthemisto Nordenskiöldi*," Bovallius, is made one of the synonyms of *Euthemisto libellula* (Mandt); *Hippomedon denticulatus* (Sp. Bate) (Tab. II. figs. 2–2*b*) is separated from *Hippomedon Holbølli* (Krøyer); on "*Aristias tumidus* (Kr. non aut.) (Tab. II. figs. 3–3*b*)," the remark is made, "Anonyx (Aristias) tumidus aut. cet. (Bruzelius, Boeck, Lilljeborg, Heller) non ad speciem a Krøyer descriptam referendus est. Speciem ab autoribus descriptam *Arist. neglectum* appello.)" (Tab. II. fig. 4); on *Amphilochus concinnus*, Stebbing, the remark is made "(*Amph. manudens* Boeck non ad *Amph. manudens* Sp. Bate referendus est)," while the identity of *Amphilochus manudens*, Boeck, with *Amphilochus concinnus*, Stebbing, is thought possible but a little doubtful; "*? Metopa borealis* G. O. Sars" (Tab. III. figs. 4, 4*a*) is 7 mm. long in contrast with the 3 mm. of Sars' specimen; on *Metopa longimana*, Boeck, (Tab. III. figs. 8–8*b*), it is observed that in Boeck's work, Pl. XVII. fig. 5 does not belong to this species, and Pl. XVIII. fig. 3 probably does not; *Metopa nasuta*, Boeck, is given with a query, since the Greenland specimens differ by elongate fourth segment of the peræon and the slightly carinate back; under *Monoculodes crassirostris*, n. sp., a discussion is given on *Monoculodes affinis* and some other species of that difficult genus; to *Paramphithoë pulchella* (Kr.), "*? Paramphithoë euacantha* G. O. Sars" is given as a synonym; of "*Melita Goësii* H. J. Hansen" (Tab. V. fig. 8) the second gnathopod is figured; "*Amathilla arenaria* (O. Fabr.)" is a new name for *Amathilla sabini* (Leach), this species being identified with *Oniscus arenarius*, O. Fabricius, 1780, but the name *Amathilla homari* will take precedence for the reasons given in the Note on J. C. Fabricius, 1779 (p. 45); see also Note on O. Fabricius, 1780 (p. 47). On "*Euthemisto compressa*," see p. 1409.

In the "Kort Oversigt over de af O. Fabricius i 'Fauna Groenlandica, 1780' omtalte højere Krebsdyr," pp. 223–226, Dr. Hansen says that the reference of *Caprella septentrionalis*, Krøyer, to *Squilla lobata*, Müller, may be regarded as well grounded; that "*Oniscus Medusarum* (Müll.)" is certainly the same as "*Hyperia Latreillei* M. Edw."; that "*Oniscus Cicada* O. Fabr." is perhaps, as Krøyer supposes, the same as "*Anonyx gulosus* Kr.," but more probably, the greedy "*Onisimus Edwardsii* (Kr.)," so common in Greenland; that "*Oniscus arenarius*, O. Fabr." is certainly the same as "*Amathilla Sabini* (Leach)," on which see above; that "*Oniscus Stroemianus* O. Fabr." may be an *Orchestia*, probably *Orchestia litorea* (Mont.), but that, since no Orchestid appears to have been since found in Greenland, the whole matter is doubtful; that "*Oniscus abyssinus* O. Fabr." partly suits *Pontogeneia inermis* (Kr.), and partly *Calliopius læviusculus* (Kr.), but neither of these entirely, nor yet any other species known from Greenland; and lastly, that "*Oniscus serratus* O. Fabr." is as already suggested by Krøyer the same as *Acanthonotosoma serratum* (O. Fabr.).

1887. Holm, Th.

Beretning om de paa Fylla's Togt i 1884 foretagne zoologische Undersøgelser i Grønland; Meddelelser fra Grønland, B. viii, pp. 153–171.

This work is mentioned by Hansen in his "Malacostraca marina Groenlandiae occidentalis," p. 216. Professor Hansen had himself supplied the lists of Crustacea for it, and in his own work takes the opportunity of correcting two names, *Monoculodes norvegicus*, Boeck (pp. 167 and 155), a wrong determination for *Monoculodes simplex*, n. sp., and *Caprella dubia*, Hansen (pp. 168, 157, and 158), which he now describes as "*Capr. microtuberculata*, G. O. Sars, var. *spinigera*."

1887. Koehler, R.

Recherches sur la structure du cerveau du Gammarus pulex. (Aus der internationalen Monatsschrift f. Anat. u. Phys. 1887. Bd. IV. Heft. 1.) Avec pl. I. 16 pages. Leipzig.

Microtome sections in various directions through the head of *Gammarus pulex* are described and figured. Since the upper antennæ carry the olfactory cylinders, the nerves which run to them are called, by Bellonci's term, the olfactory nerves. Two groups of cells which extend all along the dorsal face of the brain are designated the upper longitudinal bands; in these one cell is met with of considerable size (la cellule géante). The brain is divided into three regions; the upper including the group of the upper lobes and of the optic ganglia with the cells annexed (cells of the upper bands, of the upper lobes, and the nervous sheath of the optic ganglia), the middle including the median lobes with the median and central cells; the lower including the group of the olfactory lobes and ganglia. The middle region has its two lobes united by a commissural band which separates them from the upper region. In the central region there is a small empty space.

In comparing his own results with Bellonci's description of the brain of *Sphæroma serratum* Dr. Koehler finds that the four cellular groups attached to the upper lobes of the brain of the Isopod (the first containing the giant-cell), have their equivalents in *Gammarus*, but with less distinctness in the grouping. The optic ganglion is constituted by two distinct lobes, but has not the hinder reticulated swelling, which Bellonci found well developed in *Idotea* and rudimentary in *Sphæroma*. As in the Isopods, the nerve destined for the antenna which carries the olfactory cylinders rises in an olfactory lobe to which is annexed a swelling with special structure, besides various cellular groups. The nerve of the lower antenna springs, as in the *Sphæroma*, from the œsophageal commissure, but the group of cells connected with it at its origin is in *Gammarus* above instead of below the point of origin of the nerve. The bundles of fibrillæ coming from the olfactory region form a chiasma in the central region of the brain. These bundles penetrate into the upper, that is to say, the optic region, presenting an incomplete intercrossing, since certain vertical fibrillæ pass directly into the optic region of the same side.

The brain of *Gammarus*, therefore, Dr. Koehler says, appears to come closer to that of the Isopods than to that of the Phronimidæ as described by Claus. "Ce savant a reconnu aussi chez les Phronimides un chiasma central, mais la signification de ce chiasma comme entrecroisement de faisceaux optico-olfactifs, est moins nette que chez les Isopodes et le Gammarus, puisque le nerf olfactif ne parait pas prendre son origine chez les Phronimides dans la même région centrale que chez les autres Edriophtalmes étudiés. La région que j'ai décrite sous le nom de région moyenne ne parait pas exister chez les Phronimides. Le

renflement annexé au lobe olfactif chez les autres Crustacés fait également défaut chez ces Amphipodes aberrants."

Dr. Koehler inclines to believe that the upper longitudinal bands in the brain of *Gammarus* are homologous with the hinder lobes of the brain of the Phronimidæ, and with the fungiform bodies in the higher Arthropods, "d'autant plus qu'elles présentent avec les faisceaux optico-olfactifs les mêmes relations que chez les Arthropodes supérieures."

In the midst of the fibrillæ and of the medullary substance there are strongly coloured nuclei as to which he is doubtful whether they belong to nerve-cells, or are simple connective nuclei.

1887. KOEHLER, R.

Recherches sur la structure des fibres musculaires chez les EDRIOPHTALMES (Isopodes et Amphipodes). Journ. de l'anatomie et de la physiologie normales et pathologiques. Tome XXIII. Paris, 1887. pp. 113–123. Pl. XI.

The Amphipods selected for this investigation were "*Gammarus pulex*, *Talitrus saltator*, *Amphitoe littorina*, *Mœra grossimana*, *Anonyx Edwardsii*, *Dexamine spinosa*, *Phronima sedentaria* et *Thyropus ovoïdes*." The sections were made through the same group of muscles in the various species, and the principal result arrived at is thus expressed:—"La substance contractile est située dans la région centrale de la cellule musculaire du faisceau primitif, et se trouve entourée d'un manchon plus ou moins épais de protoplasma qui s'étend entre la substance contractile et le sarcolemme. Ainsi donc chez les Isopodes et les Amphipodes, les relations respectives des éléments contractiles et du protoplasma de la cellule myogène se trouvent être inverses de ce qu'elles sont dans les fibres musculaires des autres animaux. Il ne s'agit ici, bien entendu, que des fibres musculaires epithéliales, les fibres mésenchymateuses des Crustacés ayant une disposition bien différente et qui est connue de tout le monde." If, however, the relations of position are constant in the Amphipoda and Isopoda, between the contractile element and the protoplasm of the muscular cellule, "on observe en revanche des variations assez importantes dans la taille des cellules musculaires et des cylindres primitifs, dans le nombre de ces cylindres, dans la forme, le développement et l'importance de l'élément contractile relativement à la taille de la cellule musculaire et à l'épaisseur de la couche de protoplasma périphérique; et enfin dans le nombre, la grosseur et la distribution des noyaux."

1887. LÜTKEN, CHR. FR.

Tillaeg til "Bidrag til Kundskab om Arterne af Slægten *Cyamus* Latr. eller Hvallusene." Med en Tavle. Avec un résumé en français. Vidensk. Selsk. Skr., 6. Række, Naturvidenskabelig og mathematisk Afd. IV. 4. Kjøbenhavn, 1887.

Of the five species of *Cyamus* named by Dall in 1872–1874, Lütken identifies *Cyamus mysticeti* from the *Balæna mysticetus* and *Cyamus gracilis* from the *Balæna sibboldii* with the species so named in his own work; *Cyamus tentator* from the *Balæna sibboldii* he identifies with *Cyamus ovalis*, R. de V., and *Cyamus suffusus* from the *Megaptera versabilis* with his own *Cyamus pacificus*, and both of these he thinks should become synonyms of *Cyamus boopis*, Fabr., seeing that *Megaptera versabilis* is only another name for *Megaptera boops*.

Of "*Cyamus Scammoni* Dall" Lütken gives figures, description, and the following definition:—

"*Differt a C. ovali* (*cui similis præcipue branchiis duplicibus appendicibusque branchialibus feminarum nullis, marium longiusculis*) *branchiis in utroque sexu spiraliter contortis, appendicibus branchialibus marium posterioribus quoque bicornibus.*"

Lütken has not been able to find any confirmation of the statements of Bennett and Scammon that there are Cyami on the Cachalot (*Physeter macrocephalus*). He now thinks it may be doubtful whether the same species of *Cyamus* ever lives on different closely related species of Whale, though it is certain that the same species of Whale may play the host to two or three species of *Cyamus*.

1887. Monaco, le Prince Albert de.

*Sur les recherches zoologiques poursuivies durant la seconde campagne scientifique de l'*Hirondelle, 1886. Note du Prince Albert de Monaco, présentée par M. A. Milne-Edwards. Comptes rendus Hebdomadaires des séances de l'Académie de Sciences, par MM. les Secrétaires perpétuels. Tome CIV. No. 7 (14 Février 1887). Paris, 1887. pp. 452–454.

It is mentioned that, in dredging between the latitudes of Belle-Isle and la Gironde,

"Sur les pentes de sable fin plus ou moins vaseux qui s'étendent au large des côtes de France et par 130^{m} à 166^{m} de profondeur;

"Parmi les Amphipodes, trois formes, non signalées en ces parages, ont été recueillies: *Eusirus longipes* Boeck, *Epimeria cornigera* Fabr., *Tryphosa longipes* Sp. Bate."

1886–1887. Packard, A. S.

The American Naturalist. Vol. XX. pp. 889, 973, Vol. XXI. p. 279.

In these papers referring to the organs of smell in the Arthropoda, the views of various writers are briefly compared.

1887. Stebbing, T. R. R.

On some new Exotic Amphipoda from Singapore and New Zealand. Received November 12th, 1885, read January 19th, 1886. *From the* Transactions of the Zoological Society of London, Vol. XII. part. vi. 1887. Plates XXXVIII., XXXIX.

See Note on Stebbing, 1886 (p. 586). *Amphithopsis cærulea* (Thomson), is here named *Pherusa cærulea* as Mr. G. M. Thomson had originally proposed that it should be called. This species and *Talorchestia tumida*, Thomson, are figured, as also *Byblis kallarthrus*, Stebbing.

1887. Whymper, Edward.

Several specimens of Amphipods taken by Mr. Whymper at various localities in Ecuador have proved on examination to be the species named *Hyalella inermis* by Professor S. I. Smith. See Note on de Saussure, 1858, and on Philippi, 1860. Some of the specimens, Mr. Whymper informs me, were taken at Antisana, at a height of 13,300 feet above the sea. This, so far as I can discover, is the highest point from which Amphipoda have been obtained.

1888. Barrois, Th.

Note sur l'histoire naturelle des Açores.—De l'adaptation de l'*Orchestia littorea* Montagu à la vie terrestre. Bulletin de la Société Zoologique de France pour l'année 1888. t. xiii, séance du 10 janvier 1888. Paris, Janvier 1888. pp. 19–22.

After recalling the observations on the terrestrial habits of various species of *Orchestia* recorded by Dana, Heller, Hoek, Spence Bate, von Martens, Fritz Müller, Bate and Westwood,

Blanc and Chevreux, Professor Barrois mentions instances of *Orchestia littorea* occurring in the Azores at various heights from 15 to 80 mètres above the sea-level, and concludes that this species is a marine type tending more and more to withdraw from its primitive habitat and to become adapted to life on land. He thinks it not improbable that "*Orchestia Chevreuxi*," de Guerne, found at the bottom of the crater of Fayal, may be the same species and not a new one. He also points out that Dana recorded two terrestrial species of *Orchestia*, *Orchestia sylvicola* from the crater of Taiamai in New Zealand, and *Orchestia tahitensis* in Tahiti 1500 feet above the sea level.

1888. BARROIS, TH.

Note préliminaire sur la Faune Carcinologique des Açores. Lille, 1887. (Preface dated "Lille, le 15 Février 1888." ?)

Reference is made to "H. Drouet, Eléments de la Faune Açoréenne (*Mém. de la Soc. d'Agric., des scienc., arts et belles-lettres du départ. de l'Aube*, 2e sér., t. xii, 1861)." The only Amphipod included in the Crustacean fauna of the Azores by Drouet was *Phronima sedentaria*, Forskål. Professor Barrois here adds seven and twenty. Of the names here given, in his subsequent report he changes "*Proto Goodsiri* Spence Bate" into "*Proto ventricosa* O. F. Müller," and "*Cyamus Thompsoni* Gosse" into "*Cyamus globicipitis* Lütken;" and for some unexplained reason changes the correct spelling of *Mæra* into *Mœra*.

1888. BARROIS, TH.

Remarques sur le dimorphisme sexuel chez quelques amphipodes du genre *Mœra* (*M. scissimana* Costa = *M. integrimana* Heller, *M. grossimana* Montagu = *M. Donatoi* Heller). Extrait du Bulletin de la Société Zoologique de France, t. xiii, séance du 28 février 1888. 2 pages.

Professor Barrois, having examined the types of Heller's species, concludes that *Mæra scissimana* (Costa), and *Mæra blanchardi*, Spence Bate, are the male, and *Mæra integrimana*, Heller, the female, of one species, while *Mæra grossimana* (Montagu), and *Gammarus Impostii*, Milne-Edwards, are the male, and *Mæra donatoi*, Heller, the female, of another species.

1888. BARROIS, TH.

Catalogue des Crustacés marins recueillis aux Açores durant les mois d'Août et Septembre 1887. (Avec 4 Planches et 8 Figures dans le texte.) Lille, 1888.

In the descriptive part the Amphipods occupy pp. 30–59. Thirty-five species are named, beginning with *Phronima sedentaria*, Forskål, and ending with *Cyamus globicipitis*, Lütken, these two species, however, not being included in the number obtained by Professor Barrois himself. In the addenda at p. 100, he remarks that "l'*Orchestia Chevreuxi* de Guerne paraît être une forme véritablement nouvelle, d'après les dernières observations de de Guerne et de Chevreux." With a fuller discussion of the synonymy of *Mæra scissimana* (Costa), Professor Barrois now thinks that *Amphithoe inæquipes*, Costa, should be included in it, as in fact representing the female of the species. He gives the name "*Moera rapax*, Costa" to take precedence of the following synonyms "♂ *Elasmopus rapax* Costa," "♀ *Gammarus brevicaudatus* Spence Bate," "♀ *Megamoera brevicaudata* Spence Bate," "♂ et ♀ *Moera brevicaudata* Heller," "♀ *Elasmopus latipes* Boeck," "♂ et ♀ *Elasmopus latipes* Chevreux." This reduction of the genus *Elasmopus* under *Mæra* is supported

incidentally by a reference to "*Moera crassipes*," Haswell, a species which I myself from another point of view had been led to place under *Elasmopus*. Pl. III. gives figures of "*Moera scissimana* Costa," and of "*Moera grossimana* Montagu," Pl. IV. gives figures of "*Moera rapax* Costa" and of "*Gammarella brevicaudata* Milne-Edwards." The details of the two species of *Mæra* are also illustrated by figures incorporated in the text.

1888. CHEVREUX, E.

Troisième campagne de l'*Hirondelle*, 1887. Sur quelques crustacés Amphipodes du littoral des Açores. Bulletin de la Société Zoologique de France pour l'année 1888. t. xiii, séance du 24 janvier 1888. Paris, Janvier 1888. pp. 31–35.

1. From "Horta, île de Fayal, marée basse," ten species of Amphipods are recorded, with notes on "*Hyale Nilsoni* Rathke," "*Hyale Schmidti* Heller," and "*Hyale Stebbingi* nov. sp."; of the last a description is given, and the observation is made that "les épines crochues et dentelées des cinq dernières paires de pattes thoraciques ne se retrouvent que chez une seule autre espèce du genre: *H. Lubbockiana* Sp. Bate; mais cette dernière diffère bien nettement de *H. Stebbingi* par ses antennes inférieures plus courtes, presque glabres, et par les petites dents que portent ses épimères, et le premier article de ses pattes des trois dernières paires."
2. From "Rade de Horta, île Fayal, profondeur, 15 mètres," eight species are named.
3. "Au large de Ponta Delgada, île San-Miguel, 8 juillet, 9 h. 30 du soir, surface," "*Urothoe Poucheti* nov. sp." was obtained. This species is described, and the observation made that "cette espèce, assez voisine d'*Urothoe elegans* Sp. Bate, en diffère par sa forme moins obèse, la grandeur et l'aspect particulier de ses yeux, et surtout par ses pattes sauteuses des deux premières paires, qui sont plus développées que chez les autres espèces du genre."
4. "Au Sud de Pico, 14 juillet, 8 h. du soir, surface," two specimens were obtained of *Corophium crassicorne*, Bruzelius.

1888. CHEVREUX, E.

Sur quelques crustacés Amphipodes provenant d'un dragage de l'*Hirondelle* au large de Lorient. Extrait du Bulletin de la Société Zoologique de France, t. xiii, séance du 28 février 1888. 4 pages.

A dredging about eighty miles south-west of the île de Groix, lat. 46° 3′ N., at a depth of 100 fathoms on ground covered with Annelid-tubes, yielded twenty-seven species of Amphipoda, four of them being new species and four of them species not previously recorded from French waters. Latin descriptions are given of the new species, which are named *Lepidepecreum clypeatum*, *Phoxus maculatus*, *Amphilochus longimanus*, *Monoculodes gibbosus*, in each case the female only having been obtained. The four species new to the locality are "*Ichnopus spinicornis* Boeck," "*Stegocephalus Christianiensis* Boeck," "*Metopa rubrovittata* G. O. Sars," and "*Unciola Steenstrupi* Boeck." A footnote mentions that "*Gitana Sarsi* Boeck" has for a synonym "*Amphilochus Sabrinæ* Stebbing, *teste* G. O. Sars," which is no doubt a correct determination.

Phoxus maculatus appears to come near to *Phoxus oculatus*, G. O. Sars, but to differ from it by having the body elongate and narrow, instead of short and thickset, the eyes oval instead of round, the telson short instead of long, and perhaps also by the colouring. A male specimen of *Phoxus*, with dark oval or reniform eyes, has recently been taken by Mr. David Robertson in the Clyde, but this differs from both the described species in the shape of the first gnathopods.

1888. Chevreux, É.

Note sur la présence de l'*Orchestia Chevreuxi* de Guerne, à Ténérife, description du mâle de cette espèce et remarques sur la locomotion de l'*Orchestia littorea* Montagu. Extrait du Bulletin de la Société Zoologique de France, t. xiii, séance du 27 mars 1888. 5 pages.

The antennæ, second gnathopods, and fifth peræopods of the two species named in the title are compared, with illustrative figures, the conclusion being that the specific distinction of the two forms should be maintained.

1888. Chevreux, E., and Guerne, J. de.

Sur un Amphipode nouveau (Cyrtophium chelonophilum), *commensal de* Thalassochelys caretta *L.* 4 pages.

The chelonian was captured in the waters of the Azores, between Pico and San Jorge, and yielded seventy-seven specimens, male, female, and young, of the Amphipod. The authors say, "Cette espèce diffère bien nettement des formes déjà connues du même genre par la brièveté de ses antennes. Elle se rapproche de *C. læve* Heller par l'aspect lisse de la partie supérieure du corps; mais, en dehors du caractère mentionné ci-dessus, sa tête très courte et la forme de ses gnathopodes ne permettent pas de la confondre avec l'espèce de l'Adriatique." They consider Haswell's genus *Dexiocerella* a synonym of *Cyrtophium*, and, since *Cyrtophium læve* is preoccupied, they give to Haswell's species of that name the new title "*Cyrtophium Haswelli.*" They notice that *Cyrtophium tuberculatum* of the British Museum Catalogue ought to resume the name "*Lætmatophilus tuberculatus* Bruz.," and that "*C. armatum* Norman" is certainly also a *Lætmatophilus*. On *Dexiocerella* see p. 566.

1888. Della Valle, A.

Sopra le glandole glutinifere e sopra gli occhi degli Ampeliscidi del Golfo di Napoli. Estratto dagli *Atti* della Società dei Naturalisti di Modena—Memorie Originali—Serie III.—Vol. VII.—Modena, 1888. 6 pages.

In *Ampelisca*, it is stated, there are many large gland-cells in the connective tissue of the thoracic region; the side-plates of the gnathopods and first two pairs of peræopods are glandular, with ducts opening on the lower margin; in the first two pairs of peræopods moreover all the joints are glandular except the long awl-shaped finger, which has openings in its walls for the emission of the cement; in the fifth peræopod the excretory ducts from the gland-cells of the upper joints lead to little openings arranged along the front margin of the two terminal joints. It is no doubt to these series of duct-openings that I have referred in the description of *Ampelisca abyssicola*, p. 1051, and of *Ampelisca fusca*, p. 1056, without knowing their true meaning. Professor Della Valle mentions that Hoek had already noticed the glandular apparatus in *Ampelisca*, but it was observed still earlier by S. I. Smith. See Note on the latter author, 1874 (p. 432).

In *Haploops* the gland-cells are said to be found in the side-plates and in the first[1] and third joints of the first gnathopods, not in the side-plates but in the first four joints of the second gnathopods, in the side-plates and first three joints of the first two pairs of peræopods, and to a small extent in the first joint of the fifth pair, while in the interior of the body, both peræon and pleon, the cement-producing apparatus attains a very great development the

[1] Or second and fourth, as Professor Della Valle numbers them.

excretory ducts of the pleon-cells having their openings along the convex margin of the outer ramus of the first uropods.

In all the Ampeliscidæ of the Gulf of Naples, Professor Della Valle says, the number of the eyes is four, while the *Ampeliscæ* besides the two principal pairs have a third pair of rudimentary eyes. In a vertical section of the eye of *Ampelisca* the following strata are distinguished:—(1) the lenticular cornea; (2) the hypodermis with elongate or short cells; (3) external rhabdoms (bastoncelli); (4) crystalline cones; (5) internal rhabdoms; (6) reticulated membrane; (7) retinal cells. All the eye is surrounded in its distal part by a fine capsule of connective tissue, across which pass the fibres of the optic nerve, which before entering the ganglion form a true chiasma.

Between the eyes of *Ampelisca* and *Haploops* the principal differences are said to be, (1) the hypodermis in *Ampelisca* in the periphery of the cornea has some very long cells, but in *Haploops* only short ones; (2) in *Haploops* true *crystalline cones* are wanting, or rather these are represented by the dicotyledonous body [previously described], which is without doubt the union of the crystallogenous cells (nuclei of Semper); (3) the retinal cells are less elongate in *Haploops* than in *Ampelisca*, and do not as in *Ampelisca* segregate the internal rhabdom.

1888. GUERNE, J. DE.

Excursions Zoologiques dans les Iles de Fayal et de San Miguel (Açores). Paris, 1888.

At page 46, "*Orchestia Chevreuxi*, nov. sp.," is described.

1888. GUERNE, J. DE.

Remarques au sujet de l'*Orchestia Chevreuxi* et de l'adaptation des Amphipodes à la vie terrestie. Extrait du Bulletin de la Société Zoologique de France, t. xiii, séance du 28 février 1888. 8 pages.

The suggestion having been made that *Orchestia chevreuxi* might be the same as *Orchestia littorea*, M. de Guerne here discusses the differences in detail, and besides giving comparative figures of various parts, supplies a fresh Latin definition, that which had previously appeared having suffered from errors of the press; it is as follows:—

"Femina.—*Antennæ superiores paulo ultra articulum pedunculi penultimum antennarum inferiorum porrectæ. Pedes 2^di paris articulo 3^tio aculeis 2 armato, carpo elongato; pedes 5^ti paris perbreves; pedes 7^mi paris et pedes saltatorii 1^mi et 2^di paris valde elongati. Telson breve, ovatum, emarginatum. Animal roseo-violacescens.* Mas ignotus. Longit. 15 mm."

M. de Guerne observes that, with the exception of *Orchestia cavimana*, Hoek, all the terrestrial *Orchestiæ* are insular forms.

1888. PEREYASLAWZEWA, S., and ROSSIISKAYA, M.

Etudes sur le développement des Amphipodes. Partie I. Le développement de *Gammarus poecilurus*, Rathke. Moscow, Bull. Soc. Nat., 1888. 38 pages, 4 plates.

This work is mentioned in Friedländer's Naturæ Novitates for August, 1888.

PFEFFER, GEORG.

Die Krebse von Süd-Georgien nach der Ausbeute der Deutschen Station 1882--83. 2. Teil. Die Amphipoden. Mit 3 Tafeln Abbildungen. Aus dem Jahrbuch der wissenschaftlichen Anstalten zu Hamburg. V. Beilage zum Jahresberichte über das Naturhistorische Museum zu Hamburg für 1887. Hamburg, 1888.

Very detailed descriptions are given of the following Amphipods from South Georgia, an island lying in the south-west Atlantic, lat. 54° 0′ S., long. 36° 30′ W.

1. "*Allorchestes georgianus* nov. spec. (Taf. I, Figs. 1 a–n.)"
2. "*Metopa Sarsii* nov. spec. (Taf. II, Figs. 3, 8 und Taf. III, Fig. 2.)"
3. "*Anonyx Zschauii* nov. spec. (Taf. II, Fig. 1.)"
4. "*Anonyx femoratus* nov. spec. (Taf. II, Fig. 2.)"
5. "*Bovallia gigantea* nov. spec. (Taf. I, Fig. 5.)"
6. "*Eurymera monticulosa* spec. nov. (Taf. I, Fig. 3.)"
7. "*Stebbingia gregaria* nov. spec. (Taf. II, Fig. 7.)"
8. "*Calliopius georgianus* nov. spec. (Taf. II, Fig. 6.)"
9. "*Megamoera Miersii* nov. spec. (Taf. III, Fig. 3.)"
10. "*Leucothoe antarctica* nov. spec. (Taf. II, Fig. 4.)"
11. "*Podocerus ingens* nov. spec. (Taf. III, Fig. 1.)"
12. "*Caprellina Mayeri*, nov. spec. (Taf. III, Fig. 4.)"
13. "*Schraderia gracilis* nov. spec. (Taf. II, Fig. 5)," is figured, but the description is reserved for the continuation of the work.

The descriptions of new genera are as follows :—

"Bovallia *gen. nov. Atylidarum.*

"Körper zusammengedrückt; Rücken vorn zusammengedrückt-rundlich, an den letzten Mittelleibs- und an den drei ersten Nachleibs-Ringen gekielt und in kräftige Spitzen ausgezogen. Die Epimeren sind sehr gross, höher als die dazu gehörigen Segmente, nirgends bewimpert. Augen schmal und hoch, schlank bohnenförmig. Fühler mit starken Stammgliedern und ziemlich kurzer Geissel; keine Nebengeissel. Oberkiefer mit kräftigem, dreigliedrigen Taster, mit Borstenreihe und gezähnter Kauspitze. Rand der Innenlade des 1. Unterkiefers reichlich mit gefiederten Haaren bestanden, Aussenlade mit gesägten Stacheln; Taster zweigliedrig, mit Stachelborsten am distalen Ende. Innenrand der Innenlade des 2. Unterkiefers mit gefiederten Haaren, Distalrand beider Laden mit Borsten. Kieferfüsse stark, mit kräftigen Laden und sehr kräftigem Taster mit spitzer Endklaue. Innenlade am Distalrande mit dicken Zähnen, Aussenlade am Rande mit kleinen Stiftstacheln. Die beiden ersten Beinpaare mit Halbscheeren von etwa gleicher Entwickelung; 5., 6. und 7. Beinpaar mit länglich blattförmigen Hüften. Die beiden seitlichen hinteren Kanten jedes Stammgliedes der beiden ersten Haltopoden-Paare sowie jedes Spaltastes aller dreier Paare mit kleinen Dornen besetzt. Die Spaltäste der beiden ersten Paare tragen am Ende zwei kräftige hochrichtbare Dornen; die des letzten Paares gehen in kräftige Dornspitzen aus; an den ersten beiden Paaren ist der Aussenast kürzer, beim letzten Paare sind beide Äste gleich lang, kräftig. Schwanzschild schmal, blattförmig, bis über die Mitte gespalten."

"Eurymera *gen. nov. Atylidarum.*

"Körper nur hinten zusammengedrückt, der Rücken ganz ausserordentlich breit und flach gewölbt. Epimeren ganz ausserordentlich gross, hoch und breit. Der Stirnvorsprung ist nur ein Winkel. Auge klein, glänzend, rund, auf einen kräftig vorspringenden Höcker liegend. Telson gespalten. Fühler von mässiger Länge, die oberen ziemlich stark; der Stamm der unteren etwas länger; keine Nebengeissel. Die Aussenschneide des Oberkiefers gezähnt, ebenso die Innenschneide des linken Kiefers; eine grössere Anzahl nicht gefiederte Borsten.

Innenrand der Innenlade des 1. Unterkiefers mit vielen Fiederhaaren ; Aussenlade proximal mit schwach gefiederten Stacheln ; Taster länger als die Aussenlade, das Endglied beborstet. Laden des 2. Unterkiefers gleich lang, die innere schmäler. Proximalrand der Innenlade der Kieferfüsse mit gefiederten Borsten ; an der inneren Ecke mit einigen Stacheln ; Proximalrand der Aussenlade mit schlanken Stacheln. Die Handglieder der beiden ersten Paare nur ganz schwach ausgebildet, beim 1. Paare etwas länger und kräftiger als beim 2.; die drei hinteren Mittelleibsbeine wachsen nach der Reihe an Länge, die Coxalglieder an Länge und Breite."

"Stebbingia *gen. nov. Atylidarum.*

"Gestalt schlank. Körper zusammengedrückt, nirgends gekielt. Die Nachleibs-Segmente schwach eingesattelt, nirgends skulpiert oder in Spitzen ausgezogen. Die Epimeren sind ziemlich gross, höher als die dazu gehörigen Segmente. Augen bohnenförmig. Fühler von mässiger Länge, die oberen etwas länger, nicht so lang wie der Mittelleib. Die Stämme sind etwa gleich lang, ziemlich schlank ; die Geisseln etwa doppelt so lang wie die Stämme. Keine Nebengeissel. Oberkiefer wie bei den Atyliden überhaupt, gezähnt; die Borsten kurz, hyalin, und ungefiedert. Wenige längere Borsten am Tasterende. 1. Unterkiefer wie bei Bovallia. Innenladen des 2. Unterkiefers etwas kürzer und breiter als die Aussenlade ; die Distalenden mit Borsten. Innenlade der Kieferfüsse mit Borsten und wenigen Stachelhöckern ; Aussenlade am Distalrande mit gebogenen Stacheln, am Innenrande mit kurzen Borstenstiften. Die beiden ersten Beinpaare mit schwacher, wenig verdickter Halbscheere ; das 1. Paar ganz ausserordentlich viel schwächer als das 2. Paar. Die Coxalglieder der drei letzten Mittelleibs-Beinpaare wenig verbreitert. Telson bis zur Hälfte gespalten."

In the species *Stebbingia gregaria*, for which this genus is instituted, there is said to be no accessory flagellum to the upper antennæ and the telson is said to be a little dehiscent, but in other respects the agreement is so great with the species described in this Report as "*Atyloides australis* (Miers)" that there is strong reason for supposing them to be the same. In that case the generic name *Stebbingia* will take precedence of *Atyloides* by priority of publication, though its own title may be open to challenge from the earlier *Paramoera*, Miers (see p. 913). If *Paramoera* be legitimately discarded, the species would become *Stebbingia australis*, but again perhaps subject to some doubt as to its distinctness from *Atylus austrinus*, Spence Bate (see p. 918).

At page 107 there is a discussion upon the line of demarcation between the maxillipeds and the maxilliped-segment, and on the morphological relations of the inner plate of the maxillipeds. In this paper the joints of the limbs are numbered from one to seven, the seventh however being spoken of as the finger (die Klaue). The pleopods are "die Nektopoden" and the uropods "die Haltopoden." The genus *Schraderia* is not described. The work having only come into my hands at the last moment, it is impossible for me to discuss it with the fulness which its importance deserves.

1888. Robertson, David.

A contribution towards a catalogue of the Amphipoda and Isopoda of the Firth of Clyde. Reprinted from the Transactions of the Natural History Society of Glasgow, vol. ii. pp. 9–99. Glasgow, 1888. pp. i–iv, 5–95.

One hundred and seven species of Amphipoda are named in the body of the work, and to this number nineteen are added in the Appendix. "A few Amphipods, little known or new to

science, together with some doubtful species that are reserved for further investigation, are intended to form the subject of another small supplement to the list." Some valuable hints on methods of collection are given in the introduction. Very useful notes are also interspersed throughout the work in regard to the localities frequented by the different species, and in many instances the colouring and movements of the living animals are described. These observations which are evidently the fruit of long and careful study of the Amphipoda give the work a far higher value than that of a mere catalogue. Of "*Parathemisto oblivia*, Krøyer," taken in Sanda Bay, Mr. Robertson remarks, "only a single specimen was obtained, and it is the only one that I remember of meeting with in the Firth of Clyde. I had lately, from Dr. John Murray of the *Challenger* Expedition, some gatherings taken by the tow-net in the Firth of Forth, where this species was in great abundance at the surface, and at depths of 30 and 40 fathoms." (See Note on Brook and Calderwood, p. 1640.) Mr. Robertson explains the value of tow-nets as used on board the steam yacht "Medusa," "not only as surface-nets, but attached to the dredging-line at various depths, thus giving a tolerably correct idea of the minute inhabitants of the various zones in the water, to what extent they were distinct or intermixed, and whether those found at the surface by night were met with in the under zones by day."

1888. Rolleston, George, and Jackson, W. Hatchett.

Forms of Animal Life, a manual of Comparative Anatomywith descriptions of selected types. Oxford, M.DCCC.LXXXVIII.

Pages 531–543 contain the account of the Crustacea. Claus' classification is followed. The "Class Crustacea" is thus defined:—"Aquatic Arthropoda with cutaneous or branchiate respiration: with two pairs of antennæ, a limb-bearing thorax, either free or united more or less to the head, and as a rule a segmented abdomen which may or may not carry limbs."

Among many other remarks of value the following occur:—"The second antenna may become uniramose, or the outer branch may be reduced to a scale or squame (many *Thoracostraca*). It is minute in *Apus* and is lost in all *Cirripedia* and *Hyperidæ* (*Amphipoda*)." But that the second antenna is lost in all Hyperidæ can by no means be admitted.

"The primitive type of limb is probably that of the *Copepoda*, which closely resembles the *Nauplius* appendage. It has a basal stem carrying a more or less jointed or lamellate exo- and endo-podite. Such a limb is seen in the thoracic appendages of *Cirripedia* and of the *Schizopoda* among *Malacostraca*, and is generally found in the abdominal region."

The class is divided into Entomostraca and Malacostraca, the latter thus defined:—"Head composed of five, thorax of eight, and abdomen of six somites."

The Malacostraca are divided into Leptostraca, Arthrostraca, and Thoracostraca, the definition of the Arthrostraca being, "seven, rarely six free thoracic somites; eyes sessile; no cephalothoracic shield."

The Arthrostraca are subdivided into Amphipoda and Isopoda, the Amphipoda being defined as follows:—"body laterally compressed; branchiæ on thoracic limbs; first three pairs of abdominal feet natatory: *e.g. Caprella, Cyamus, Talitrus, Orchestia, Gammarus, Hyperia, Phronima.*" To the lateral compression of the body here mentioned there are several exceptions. The characters given are generally applicable, but *Caprella* is little suited to stand as the leading illustration, since in that genus the body is rather cylindrical than compressed, the thoracic limbs are missing from the segments which carry the branchiæ, and there are no natatory abdominal feet.

1888. Walker, Alfred, O.

Report on the Crustacea of Liverpool Bay, 1886–1887. [From Proc. Biol. Soc., L'pool. Vol. II. 1888.] pp. 171–181, with Plate XIII.

Twenty-eight species of Amphipoda are recorded. Of *Tryphosa ciliata*, Sars, figs. 1–4, it is remarked that "the colour, which is milk white, is very protective among broken shells," from among which the specimens were obtained. "*Pleustes bicuspis*, Kröyer," figs. 5–9, is described, being distinguished from *Pherusa bicuspis*, Spence Bate, and identified with the following synonyms, *Pleustes bicuspis*, Kröyer; *Paramphithoe bicuspis*, Bruzelius; *Paramphithoe bicuspis*, A. Boeck; *Amphithopsis bicuspis*, A. Boeck; *Calliopius bidentatus*, Norman. To these names *Pleustes bicuspis*, Boeck, should have been added. The observations show that in the synonymy *Pleustes bicuspis*, Kröyer, has been printed by mistake for *Amphithoe bicuspis*, Kröyer. Reference is made to Norman and Chevreux, with regard to an undescribed species, *Eiscladus brevicaudatus*, having the third uropods shorter than in "*Photis* (*Eiscladus*) *longicaudatus*, Bate."

Notes on colouring are given as to "*Pontocrates Norwegicus*, Boeck, = *Kroyera arenaria*, Bate"; "*Urothoe elegans*, Bate;" "*Pleustes bicuspis*, Kröyer"; "*Atylus Schwammerdamii*, M. Edwards"; "*Calliope leviuscula*, Kr."; "*Cheirocratus Sundevalli* = *Lilljeborgia Shetlandica*, Bate"; "*Gammaropsis erythrophthalmus*, Lillje. *Eurystheus erythrophthalmus*."

1888. Wrześniowski, A.

O trzech kiełżach podziemnych. De tribus Crustaceis Amphipodis subterraneis, commentatio zoologica.

Professor Wrześniowski has very obligingly sent me the following brief resumé of the above-mentioned work, which is to appear almost immediately:—

"Histoire détaillée des travaux sur les Amphipodes souterrains et des grandes profondeurs: *Niphargus*, *Eriopis* et *Crangonyx*.

"Description: *Niphargus tatrensis* nov. sp. et *Boruta tenebrarum* gen. et sp. nov. d'un puit à Zakopane (village au pied des montagnes Tatra), ainsi que celle du *Niphargus puteanus* var. *Vejdovskyi* var. nov. d'un puit à Prague en Bohème.

"Comparaison avec les formes connues.

"Distribution des Amphipodes souterrains et des grandes profondeurs d'eau douce."

"Ce travail contiendra aussi 11 tables lithographiées."

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[1] On p. 121, line 8, for Anzahl read Unzahl.

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[1] On p. 273, last line, for Valpes read Vulpes.

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[1] On p. 899, line 29, for Atylinæ read Atylina.
[2] On p. 1154, line 17, for Family COROPHIIDÆ read Family COROPHIDÆ.
[3] On p. 336, "Subfamily 2. Corophiides," should precede the mention of *Cratippus*.
[4] The earliest use of this term embraced the Amphipoda at large.

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[1] On p. 573, line 1, this form is suggested as the proper one in case the Dexaminæ are distinguished as a family from the Atylidæ.

[2] On p. 559, line 25, for Duchilidæ read Dulichiidæ.

[3] On p. 1182, line 24, for Family DULICHIIDÆ read Family DULICHIDÆ.

[4] In the Errata to Boeck's work the remark is made, "Instead of Divisio *Gammaridæ* read *Gammarida*."

[5] The earliest use of this term embraced the Amphipoda at large.

[6] In the Errata to Boeck's work it says "Instead of Divisio *Hyperidæ* read *Hyperida*."

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[1] Milne-Edwards uses both forms, Læmodipodes and Lœmodipodes.

[2] On p. 606, the family Lysianassidæ should have been attributed to Buchholz and S. I. Smith, instead of G. O. Sars.

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[1] For Phronimidæ, in the Table, p. 290, read Phronomidæ.

[2] On p. 805, line 3, for Pontoporeidæ read Pontoporeides.

[3] Boeck, in quoting Lilljeborg's classification, gives the form *Pontoporina* by mistake for *Pontoporeina*.

[4] On p. 393, it should have been noticed that in the index to his work Boeck adopts the form Prostomatidæ in place of Prostomatæ.

INDEX OF GENERIC NAMES.

NOTE.—The names held to be valid are printed in black letters, those of which I have been unable to find any published description are in ordinary type, and synonyms and preoccupied names in italics. When the author of a generic name has himself given or indicated the derivation of it, his own statement in the original language or translated appears between marks of quotation. The derivations of new generic names, having already been given in the text, are not repeated here. Dark numerals refer to the page on which the definition of a genus occurs.

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[1] Compare the remark on *Amphithoë* sp., by Fritz Müller, p. 349.

[2] This form competes with the later, generally accepted, and philologically better, form *Amphithoë*.

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Bathyporeia, Lindström, 1855. βαθύς, deep, πορεία, passage. "Af denna nya form har jag hittils endast funnit några få exemplar på sand-botten med 18–24 famnars djup utanfor Wisby," **286**, 291, 294, 305, 328, 393, 581
Bathyporeja, misspelling of *Bathyporeia*, Lindström, ... 296
Batyporeia, misspelling of *Bathyporeia*, Lindström.
Bellia, Spence Bate, 1851. Named after Thomas Bell, the English carcinologist. (=*Haustorius*, P. L. S. Müller), ... 243, **244**, 263, 581, 1624
Bircenna, Chilton, 1884. "Bircenna, the daughter of the Illyrian Bardyllis, was one of the wives of Pyrrhus," **551**
Bivonia, Cocco, 1832. "Ho voluto intitolarlo al mio compatriota barone A. Bivona Bernardi, ... delle cose naturale della Sicilia illustratore amplissimo." (=*Phronima*, Latreille), . . **146**, 1624
Boeckia, O. Grimm, 1880. Preoccupied by Malm, 1870, ... 509
Boeckia, Malm, 1870. Named after the Norwegian zoologist, Dr. Axel Boeck, so distinguished in connection with the Scandinavian Amphipoda. (=*Leptocheirus*, Zaddach), ... **404**
Boruta, Wrześniowski, 1888. "Boruta est le nom d'un diable, qui, d'après une vieille legende polonaise, habite les caves souterraines et garde les trésors, qui y sont accumulés," . . . 1656
Boscia, Leach, in Desmarest, 1825, as synonym of *Melita*, Leach. A name derived from Bosc, the French naturalist, ... 122
Bovallia, Pfeffer, 1888. Evidently named after C. Bovallius, the carcinologist, ... **1653**
Brachyscelus, Spence Bate, 1861. "βραχυς, short, σκελος, leg," **327**, 337, 350, 492, **1543**
Brandtia, Spence Bate, 1862. Named after J. F. Brandt, the carcinologist, ... 247, 309, **334**, 581
Bruzelia, A. Boeck, 1870. "Named in honour of R. Bruzelius, author of Skand. Amphipoda Gammaridea," 394, **400**, 569, 581
Byblis, A. Boeck, 1870. "Βυβλίς, a daughter of Eidothea," 395, **402**, 570, 581, 601
Calamorhynchus, Streets, 1878. κάλαμος, reed, ῥύγχος, snout or beak, ... **484**, 591, **1599**
Callianira, Leach, MS., White, 1847. (=*Hyperia*, Latreille), ... 223
Callimerus, Stebbing, 1876. "The generic name refers to the beauty of the denticulate membranaceous thighs." καλός, beautiful, μηρός, thigh. (=*Amphilochus*, Spence Bate), ... 460, **484**, 581, 583
Calliope (Leach, MS.), Sp. Bate, 1856–7. Καλλιόπη, one of the Nine Muses. Preoccupied among Mammals and Birds in 1836, ... **294**, 328, 360, 581, 583
Calliopius, Lilljeborg, 1865. Altered from *Calliope*, Sp. Bate, ... 294, 360, 395, 573, 581
Callirhoe, Rafinesque, 1815. Name of a fountain, and of a daughter of Oceanus, ... 88
Callisoma, A. Costa, 1851. (Named, but not described, by O. G. Costa, 1840.) "From the Greek words καλός, beautiful, and σῶμα, body," 183, **247**, 248, 270, 293, 296, 328, 362, 393, 580
Camacho, Stebbing, 1888, ... **1178**
Cancer, ancient comprehensive genus, no longer including Amphipoda, ... **11**, **12**, 13, **17**, **18**, **29**
Cancer (*Gammarellus*), Herbst, 1796, ... 60
Cancer (*Gammarus*), Montagu, 1808, ... 54, 69, 79
Caprella, Lamarck, 1801. A diminutive from capra, a she-goat, ... **66**, 79, 84, 88, 90, 95, 96, 123, 126, 135, 157, 171, 175, 183, 191, 192, 194, 202, **231**, 249, 256, 265, 274, **282**, 316, 328, 329, 343, 375, 397, 426, 477, 535–537, 566, 571, **1251**, 1268
Caprellina, G. M. Thomson, 1878. An ally of *Caprella*, another genus. Preoccupied as name of a group (see *Caprellinopsis*), ... 233, **499**, 535, 537
Caprellinoides, Stebbing, 1888, ... **1237**, 1268
Caprellinopsis, 1888. New name for *Caprellina*, Thomson, preoccupied as the name of a whole group of genera, ... 233, 1237, 1268
Capreola, 1825. Mistake for, or intended correction of, *Caprella*, ... 121
Carcinococcus, de Natale, 1850. Καρκίνος, a crab, κόκκος, a kernel or berry. Included by mistake among the Amphipoda, ... 248
Carcinornis, A. Costa, 1864. Καρκίνος, a crab, ὄρνις, a bird. In allusion to the rostrum in this genus, ... **347**, 562
Carcinus, Latreille, 1796. Greek καρκίνος, a crab. No species were assigned to this genus, which according to Desmarest in 1825 is a synonym of *Gammarus*, Fabr., . . . 1, 62, **63**, 123
Cardenio, Stebbing, 1888, ... **806**

Cephalaspis, A. Costa, 1851. Κεφαλή, head, ἀσπίς, shield. Preoccupied among fossil fishes in 1835, ... 249

Ceradocus, A. Costa, 1853. "From the Greek words κέρας, horn, antenna, and δοκός, beam." (=*Mæra*, Leach), ... 206, 274, 296, **298**, 561, 581, 583

Cerapodina, Milne-Edwards, 1840. A name formed from that of the genus *Cerapus*, Say. (=*Cerapus*, Say), ... 168, **188**, 202, 228, 257, 261, 296, 559, 580

Cerapus, Say, 1817. "From κέρας, a horn, and πούς, a foot, in allusion to the animal employing its antennæ as feet," **100**, 123, 148, 170, 176, 184, 188, 192, **207**, 228, **257**, 261, **283**, 296, 307, 328, 349, 350, 375, 390, 396, 522, 559, 563, 571, 580, 581, **1157**

Cercops, Krøyer, 1843. "Κέρκωψ, caudatus." In this genus of the Caprellina, the pleon or cauda has five segments, ... **202**, 256, 329, 396, 535, 537, 1226, 1268

Cerophas, Rafinesque, 1815, ... 88

Cesapodina, misspelling of *Cerapodina*, M.-Edw., ... 426

Charybdis, Cocco, 1832. A whirlpool in the Mediterranean. Altered by the author to *Orio*, as *Charybdis* was preoccupied by Rafinesque among the Podophthalma, . . . 145

Cheirimedon, Stebbing, 1888, ... **638**

Cheirocratus, Norman, 1867. "χείρ and κρατεω, strong in the hand," **370**, 395, 581, 582

Cheiropristis, de Natale, 1850. χείρ, hand, and probably πρίστις instead of πριστής, a saw, . 236, **237**, 239, 248

Chelura, Philippi, 1839. χηλή, claw, οὐρά, tail, ... 181, **217**, 228, 256, 307, 328, 375, 383, 396, 580

Chiropristis, Cocco, 1832. Undescribed, afterwards described as *Cheiropristis* by de Natale, 1850, ... 145, 233, 562

Chloris, Haswell, 1880. A mythological name. Twice preoccupied, the name afterwards changed to *Harmonia*, ... **514**, 528

Chosroës, Stebbing, 1888, ... **1208**

Cleippides, A. Boeck, 1870. "Κλεϊππίδης, name of a Greek," 216, 395, **401**, 569

Cleistotoma, O. G. Costa and A. Costa, 1840. Preoccupied, ... 183

Cleonardo, Stebbing, 1888, ... 498, **959**

Clidippides, by mistake for *Cleippides*.

Clydonia, Dana, 1849. "The name of the genus is from κλυδων, a wave, and alludes to the place of occurrence of the species." (=*Scinà*, Prestandrea), ... 228, **229**, 255, 256, 265, 558, 580, 582

Colomastix, Grube, 1861. κόλος, stunted, μάστιξ, lash, flagellum, . . . **329**, **348**, 391, 460, 517, 580, 582

Constantia, Dybowski, 1874. Preoccupied among Mollusca in 1860 (see *Costantia*), . . . 427, **428**, 581

Corophia, misspelling of *Corophium*, Latreille, ... 142, 184

Corophium, Latreille, 1800. According to Agassiz from κορος, curvus, but there is no such meaning to the word κόρος, nor would it be applicable to this genus if there were. Bailey's Facciolati in the following passage shows that it is useless to seek for a derivation of this name:—"Coluthia, orum. Muricum genus sunt, quae vocant Graeci coluthia, alii corythia, turbinata aeque, sed minora multo, efficaciora etiam, et oris halitum custodientia. *Hæc Plin.* l. 32, c. 7. ed. *Hard.* Antea v. g. in ed. *Elzev.* legebatur *colycia*. Adde c. 11. ed. Hard. ubi antea *colycia* vel *corophia* legebatur, . . **79**, 84, 88, 90, 123, 135, 148, 170, 176, 184, 189, 192, 228, 249, **255**, 256, 265, **283**, 296, 307, 312, 328, 375, 396, 580

Corophrium, misspelling of *Corophium*, ... 86

Costantia, misspelling of *Constantia*, Dybowski, adopted instead of *Constantia*, preoccupied, ... 427, **428**

Crangonyx, Spence Bate, 1859. κραγγών, a shrimp, νύξ, night, ... **311**, 328, 414, 581, 1656

Cratippus, Spence Bate, 1862. Κράτιππος, a Peripatetic philosopher. (=*Colomastix*, Grube), 328, **336**, 391, 517, 580, 582

Cratipus, misspelling of *Cratippus*, Sp. Bate.

Cratophium, Dana, 1852. κράτος, strength. (=*Podocerus*, Leach), ... **257**, 261, 580

Cressa, A. Boeck, 1870. "Κρήσσα, a Cretan woman." (=*Danaia*, Spence Bate, which is preoccupied), ... 293, 394, **400**, 570, 581, 582, 747

Cuvieria, Leach, in Desmarest, 1825, as synonym of *Leucothoe*, Leach. After the celebrated naturalist Cuvier, ... 122

Cyamus, Latreille, 1796. κύαμος, a bean. "Ce nom, qui signifie en grec fève, avoit été donné à des cloportes, parce qu'ils ressemblent en quelque sorte à cette semence lorsqu'ils sont dans un état de contraction. Les crustacés dont il s'agit ici sont peu éloignés des cloportes, et c'est même dans ce genre que Linnæus les a placés." (Latr., Hist. Nat., tome vi. p. 328), ... **2**, **63**, **66**, **72**, 79, 88, 92, 96, 98, 105, 124, 126, 134, 135, 155, 163, 169, 171, 175, 191, 192, 194, 208, 227, 249, 256, 281, 282, **306**, 316, 325, 328, 329, 397, **419**, 426, 450, 477

Cychreus, Rafinesque, 1815, ... 88

Cyclocaris, Stebbing, 1888, ... **664**

Cyllias,[1] Bovallius, 1887. The name was probably chosen to indicate an affinity with the neighbouring genus *Cyllopus*, ... **588**

Cyllopus, Dana, 1852. κυλλός, crooked, maimed, πούς, foot. "Feet of seventh pair nearly rudimentary," **268**, 452, **487**, 580, 588, 593 **1296**

Cymadusa, Savigny, 1816. κῦμα, a wave, δύω, I enter. (=*Amphithoë*, Leach), ... 93, 120, 123

Cymothoa, J. C. Fabricius, 1793. Cymothoe, one of the Oceanides, see Hesiod, Theogonia, 245. An Isopod genus in which three species of Amphipoda were at one time included, . . . 59, 85, **1618**

Cyphocaris, Lütken and Boeck, 1870. "κῦφος, hump, κάρα, head," 393, **398**, 580, **656**

Cypridoidea, alteration of *Cyproidea*, Haswell, to suit the derivation, see Scudder, Nom. Zool., p. 366.

Cyproidea,[2] Haswell, 1880. See *Cyproidia*, ... 514, 581

Cyproidia, Haswell, 1880. From its likeness to *Cypris*, an Entomostracan genus, . . 441, 512, **513**, 514, 539, 574

Cyrtophium, Dana, 1852. κυρτός, curved, ... **257**, 261, 265, 328, 349, 518, 521 563, 580, 581, 1651

Cysteosoma, a variation in the spelling of *Cystisoma*, Guérin, ... 575

Cystisoma, Guérin, 1842. κύστις, a bladder, σῶμα, body (not to be confused with *Cystosoma*, Westwood, among the Hemiptera), ... **196**, 259, 452, 575, 1269, **1318**

Cystosoma, misspelling of *Cystisoma*, Guérin, ... 440, 444, 452, 471, 487, 580

Dactylocera, Latreille, 1829. δάκτυλος, finger, κέρας, horn. (=*Phrosina*, Risso), . 125, **137**, 142, 143, 144, 170, 175 184,[3] 191, 259, 487

Dactylocerus, a variation in the spelling of *Dactylocera*, Latreille. See Desmarest, 1825, ... 122

Daira, Milne-Edwards, 1830. Mythological name (Agassiz). Preoccupied, . . **143**, 170, 175, 184, 190, 258, 264 558, 580, 1336

Dairella, Bovallius, 1887. Diminutive of *Daira*, ... **589**, 1269, **1342**

Dairilia, Dana, 1852. Altered from *Daira*, Milne-Edwards, ... 264, **268**, 337, 590, 1543

Dairinia, a misprint in Dana's work for *Dairilia*, ... 264, 558, 580

Danaia, Spence Bate, 1857. "The genus is named after Professor Dana, to whom science is indebted for a valuable work on Crustacea." Preoccupied,[4] . . . **293**, 328, 394, 570, 581, 582, 747

Darwinea, Spence Bate, 1856. Described as *Darwinia*, 1857.

Darwinia, Spence Bate, 1857. "This genus is named in compliment to the distinguished author of the Monograph on the Cirripedia." (=*Lafystius*, Krøyer), . . . **294**, 328, 581

Dercothoe, Dana, 1852. "The name of the genus, from δερκω, *to look*, alludes to the projection forward of the eyes on a prominence of the front margin on either side of the head,—a frequent, if not universal, characteristic of the species." (=*Ericthonius*, Milne-Edwards), ... **258**, **267**, 268, 375, 580, 581

Dermophilus, E. van Beneden and Bessels, 1870. δέρμα, skin, φίλος, attached to. Perhaps a synonym of *Lafystius*, Krøyer, 1842, ... 392, 464

Desmophilus, misspelling of *Dermophilus*, ... 463

Dexamine, Leach, 1814. Δεξαμένη, a Nereid, see Homer, Iliad, xviii. 44, . . **86**, **89**, 90, 122, 148, 170, 176 192, 229, 249, 258, 328, 379, 395 573, 581, **945**

Dexiocerella, Haswell, 1885. δεξιός, ready, nimble, κέρας, horn, antenna, with a diminutive termination. (=*Platophium*, Dana), ... **566**, 1184, 1651

Dinoa, Rafinesque, 1815, ... 88

Diphyicola, A. Costa, 1862. *Diphya*, an Acaleph genus, *colo*, I inhabit, ... 340, 1348

Dithyrus, Dana, 1852. δίθυρος, with two doors. "Pedes 5ti 6tique articulo 1mo lati lamellati," **259**, **269**, 327, 490, 591, 1471

Dodecas, Stebbing, 1883. δωδεκάς, a number of twelve. "Six pairs of feet attached to the pereion, the fourth segment having none," 461, **547**, **1232**

Dryopé, Spence Bate, 1862. Δρυόπη, a nymph. Preoccupied in 1830, ... 328, **336**, 580, **1145**

Dryopoides, Stebbing, 1888, ... **1145**

[1] This genus was instituted doubtfully by Bovallius to receive the single species *Hyperia cuspidata*, Streets, but as the species in question belongs, I think, clearly to the genus *Paraphronima*, Claus, the name *Cyllias* will not be needed.

[2] On p. 514, l. 11, for *Cyproidia* read *Cyproidea*. The latter form is given in the *Annals and Magazine of Natural History* for January 1880, but precedence may perhaps be allowed to the form *Cyproidia*, which in the same year 1880 appears in the *Proc. Linn. Soc. N. S. W.*, since Mr. Haswell would have had the opportunity of correcting the press in Australia but not in England.

[3] For *Dactylocerus*, p. 184, line 6, read *Dactylocera*.

[4] In 1849 Milne-Edwards and J. Haime, *Comptes rendus*, t. xxix. p. 261, gave the name *Dania* to a genus of fossil Corals; this name they spell *Danaia* in the general index to their Monograph of the British Fossil Corals, Palæont. Soc. vol. for 1854, published 1855. *Danaia*, Spence Bate, must therefore give way to the later *Cressa*, Boeck, with which a specimen of the type species, recently obtained and dissected, proves it to be certainly synonymous. Compare the earlier footnote, p. 747.

Dulichia, Krøyer, 1845. "Formed from δουλιχός, long, with regard to the specially elongated form of the animal, the long antennæ, &c. The Ionic form is used to keep the name the more distinct from *Dolichus* already employed for the name of an Insect," **213**, 228, 256, 294, 295, 306, 328, 396, 571, 580, 601

Dyopedos, Spence Bate, 1857. Perhaps from δύο, two, and πούς, foot, because in this genus the sixth and seventh pairs of feet are attached to one compound segment. (= *Dulichia*, Krøyer), ... **294**, 295, 580

Egidea, a misspelling of *Egidia*, A. Costa.

Egidia, A. Costa, 1853. Proper name. Compare Latin Ægidius. (= *Urothoe*, Dana), . . 274, **296**, 561, 580, 582

Eiscladus, Bate and Westwood, 1862. "εἷς, one, κλάδος, branch, in allusion to the structure of the posterior pair of pleopoda." (= *Photis*, Krøyer), ... **341**, 396, 581

Elamis, Leach, MS., in White, 1847. (= *Amphithoë*, Leach), ... 222

Elasmocerus, A. Costa, 1851. ἐλασμός, lamina, κέρας, horn, antenna, ... 248, 1278

Elasmopus, A. Costa, 1853. "From the Greek words ἐλασμός, lamina, and πούς, foot," 274, **298**, 296, 395, 580, 582, 1649

Enone, Risso, 1826. ? from Οἰνώνη, Œnone, the nymph beloved by Paris, ... **128**, 249

Ephippiphora, White, 1847. ἐφίππια, the trappings of a horse, φέρειν, to bear. Preoccupied, 1834, ... 177, **224**, 270, 393, 500

Epidesma, a misspelling of *Epidesura*, Boeck.

Epidesura, Boeck, 1860. From ἐπιδεής, deficient, οὐρά, tail, the fifth and sixth segments of the pleon or tail being united into one. (= *Atylus*, Leach), ... **322**, **324**, 581

Epimeria, A. Costa, 1851. Probably so called from the *epimera* or side-plates, "Epimera quarti et quinti articuli thoracis maxima, simul clypeum semilunare formantia," 249, **250**, 296, **297**, 395, 475, 569, **877**

Eratea, Rafinesque, 1815, ... 88

Erichthus, Latreille. Not an Amphipod genus, ... 134, 135, 148

Erichthoneus, misspelling of *Ericthonius*, Milne-Edwards.

Erichthonius, an alternative spelling for *Ericthonius*, Milne-Edwards, to correspond with the Greek original of the word, ... 170, 176, 200, 228, 255, 257, 258, 268, 559, 571, 580, 581

Erichtonius, misspelling of *Ericthonius*, Milne-Edwards, ... 184, 312, 375

Ericthonius, Milne-Edwards, 1830. Ἐριχθόνιος, Erichthonius, a king of Athens, . **142**, 188, **285**, 296, 299, 390, 396

Eriopis, Bruzelius, 1859. "A daughter of Jason and Medea." Preoccupied. (= *Niphargus*, Schiødte), ... **313**, 395, 581, 1656

Erpetoramphus, de Natale, 1850. ἑρπετόν, a creeping thing, ῥάμφος, a crooked beak, . . . 248, **1623**

Erysthoeus, misspelling of *Eurystheus*, Spence Bate, ... 583

Erysthræus, misspelling of *Eurystheus*, Spence Bate, ... 566

Erythrocephalus, Tilesius, 1819. ἐρυθρός, red, κεφαλή, head. "Rothkopf." An obscure genus of the Hyperina, ... 109, 135

Etione, misspelling of *Enone*, Risso (M.-Edw., 1830).

Euone, misspelling of *Enone*, Risso, ... 560

Euonyx, Norman, 1867. εὖ, well, ὄνυξ, nail. In the second gnathopods, unlike *Anonyx*, "nail large and strong," **370**, **668**

Eupheus, Risso, 1816. εὖ, well, φαιός, dusky ? (Agassiz), but more probably from εὐφυής, well fitted. (Synonym of *Apseudes*, generally reckoned an Isopod genus), . . **97**, **129**, 134

Eupronoë, Claus, 1879. εὖ, well, *Pronoe*, name of another genus, ... 241, **492**, 591, **1509**

Eurymera, Pfeffer, 1888. εὐρύς, broad, μηρός, thigh; "Epimeren ganz ausserordentlich gross, hoch und breit," **1653**

Eurysteus, misspelling of *Eurystheus*, Spence Bate, ... 544

Eurystheus,[1] Spence Bate, 1856–7. A king of Mycenæ, the taskmaster of Hercules. (= *Gammaropsis*, Liljeborg), ... 286, **294**, 328, 335, 580, **1092**

Eurytenes, Lilljeborg, 1865. "From the Greek εὐρυτενής, which signifies widely stretched." Preoccupied in 1862, ... **360**, 393, 580

Eurythenes,[2] S. I. Smith, 1884, either an accidental misspelling or intentional alteration of the preoccupied *Eurytenes*, Lilljeborg, ... 557

Eurytheus, misspelling of *Eurystheus*, Spence Bate.

Eusceliotes, 1888, in place of *Euscelus*, Claus.

Euscelus, Claus, 1879. εὖ, well, σκέλος, leg. Preoccupied, ... **491**, 591

Eusinus, misprint for *Eusirus*, Krøyer (Scudder, Nomenclator Zoologicus, p. 123).

Eusiroides, Stebbing, 1888, ... **969**

[1] On the question of the priority of *Eurystheus*, see p. 1092.

[2] In the Note on S. I. Smith, 1884, p. 557, I have not reproduced the spelling *Eurythenes*, having regarded it as a casual misprint, but the same spelling is given in Scudder's Nomenclator Zoologicus on Professor Smith's authority.

Eusirus, Krøyer, 1845. "Εὔσειρος, Eusirus, a son of Poseidon and Idothea, a daughter of Ocean," **213**, 229, 258, 328, 394, 581, **964**

Euthemisto, Bovallius, 1887, altered from *Themisto*, Guérin, ... 589, 593, **1407**

Eutyphes, alteration of *Eutyphis*, Claus, ... 591

Eutyphis, Claus, 1879. Altered from *Typhis*, Risso. (= *Platyscelus*, Spence Bate), . . 269, **490**, 561, 591, 597, 1463

Exunguia, Norman, 1869. "From *ex* and *unguis*, without a nail." (= *Colomastix*, Grube, 1861), ... **391**, 517, 580

Galanthis, Spence Bate, 1856–7. A maid-servant of Alcmene, turned into a weasel for deceiving Lucina. Preoccupied, ... 172, **293**

Gamarus, misspelling of *Gammarus*, Fabricius, ... 12, 14

Gammaracanthus, Spence Bate, 1862. *Gammarus*, another genus, ἄκανθα, spine, ... **335**, 395, 581

Gammarella, Spence Bate, 1857. Diminutive from *Gammarus*, another genus, ... **294**, 328, 581

Gammarellus, Herbst, 1796. Diminutive of *Gammarus*, used by Herbst in combination with *Cancer*, ... 59, 1617

Gammarius, misspelling of *Gammarus* Fabricius, ... 416

Gammaropsis, Liljeborg, 1855. *Gammarus*, another genus, ὄψις, appearance. (See note on *Eurystheus*), ... **285**, **286**, 294, 396, 550, 580, **1092**

Gammarus, J. C. Fabricius, 1775. κάμμαρος, Latin cammarus or gammarus, applied originally to various Crustacea, other than Amphipods 4, 5, 11, 12, **40**, **43**, 53, **56**, **62**, **66**, **78**, 79, 84, 86, 88, **90**, **92**, 99, 123, 135, 148, 162, 170, 175, 184, **187**, 192, 194, 228, 249, **255**, 258, 283, 285, 294, 296, **308**, 313, 316, 328, 331, 353, 359, 375, 378, 384, 391, 392, 395, **428**, 477, 563, 581, 601, **1005**, 1225, **1629**

Gampsonyx, Jord., 1847. γαμψῶνυξ, with crooked talons. A genus among fossils doubtfully connected with the Amphipoda, ... 353, 472

Gitana, A. Boeck, 1870. The Spanish word for a Gipsy, ... 394, **400**, 581

Glauconome, Krøyer, 1845. "One of the Nereids." Preoccupied among Polyps 1826 and Mollusca, 1828. (= *Unciola*, Say, 1818), ... **212**, 229, 263, 396, 571, 580, 1168

Glossocephalus, Bovallius, 1887. γλῶσσα, tongue, κεφαλή, head, ... **590**

Glycera, Haswell, 1880. Γλυκερά, sweet, the name of a woman in Horace, Tibullus and Martial. Preoccupied among the Vermes, 1817, ... **512**, 514, 528, 533, 580, 582

Glycerina, Haswell, 1882. "Altered from *Glycera*," 512, 533, 643

Goësia, A. Boeck, 1870. "Named in honour of Goës, author of 'Crust. Amphip. maris Spetsbergiam alluentis,'" 358, 396, **402**, 580

Goplana, Wrześniowski, 1879. From "Goplany, Polish for a Water-nymph," . . 360, 472, **501**, 581, 583, 601

Gossea,[1] Spence Bate, 1862. "The genus is named in compliment to Mr. Gosse, in consideration of his valuable contributions to marine zoology," **334**, 580

Grammarus, a mistake for *Gammarus*, ... 317

Graya, misprint for *Grayia*, ... 473

Grayia, Spence Bate, 1862. "It is named in compliment to the Keeper of the Zoological collections of the British Museum," 266, 328, **332**, 435, 581

Grubia, Czerniavski, 1868. Named in honour of Grube the naturalist, ... **377**, 517, 560, 566, 1115

Guerinia (Hope), A. Costa,[2] 1853. Named after Guérin, the eminent French naturalist. Preoccupied in 1830, ... **272**, 561

Guernea, E. Chevreux, 1887. "Je prie mon excellent ami, M. Jules de Guerne, d'accepter la dédicace de ce genre nouveau." In place of *Helleria*, Norman, preoccupied, ... 386, **595**

Halibrotus, alteration of *Alibrotus*, M.-Edw., to suit the derivation (Costa, 1853).

Halice, A. Boeck, 1870. ἁλική, a briny maid, ... 394, **400**, 581

Halicreion, A. Boeck, 1870. "ἅλς, sea, κρείων, ruler," 395, **401**, 581

Halicrion, misspelling of *Halicreion*, Boeck (Scudder, Nom. Zool., p. 139).

Halimedon, A. Boeck, 1870. "ἅλς, sea, μέδων, lord," 356, 394, **400**, 581, **838**

Halirages, A. Boeck, 1870. "ἅλς, sea, ῥήγνυμι, I break," 395, **401**, 569, 573, 581, **900**

Halirhages, alteration of *Halirages*, Boeck, ... 523

Haplocheira, Haswell, 1880. ἁπλοῦς, simple, χείρ, hand. "Both pairs of gnathopoda simple," 500, **512**, 514, 565, 580, **1171**

[1] *Gossea* appears to have been used by Agassiz also in 1862 for a genus of Cœlenterata.

[2] The name *Guerinia* being preoccupied will become a synonym of *Trischizostoma*, Esmark and Boeck, 1860.

Haploops, Liljeborg, 1855. "From ἁπλοῦς, simple, and ὄψ, eye, because the eyes are simple, not compound," 270, **285**, 385, 386, 395, 454, 581, 1651

Haplochira, variation in spelling of *Haplocheira*, Haswell (Scudder, Nom. Zool., p. 369).

Harmomia, misspelling of *Harmonia*, Haswell, ... 513

Harmonia, Haswell, 1880. Ἁρμονία. Harmony, personified in mythology. Preoccupied, . . 512, **513**, 514, **565**

Harmophia, Boeck, MS., 1877, ... 466

Harpina, A. Boeck, 1870. ἅρπη, a sickle. Preoccupied among the Coleoptera (Dejean) Burmeister, 1844, ... 394, **400**, 581

Harpinia, A. Boeck, 1876. "A Greek feminine name." Altered from *Harpina*, Boeck, . . . 394, 568, 819

Harpinioides, Stebbing, 1888, ... **936**

Harplia, Boeck, MS., 1877, ... 466

Haustorius, P. L. Statius Müller, 1775. Haustor, one that draws or drains, water or the like, 39, 229, 244, 394, 474, 1624

Heiscladius, variation in the spelling of *Eiscladus*, Spence Bate, ... 430

Heiscladus, a variation in the spelling of *Eiscladus*, to suit the derivation.

Hela, A. Boeck, 1860. "A northern, mythological name." Preoccupied (see *Neohela*), . 322, **325**, 396, 530, 580, 1215

Helella, attributed to Smith by Sars, probably by mistake for *Neohela*, ... 1215

Helleria, Norman, December 1868. "I have dedicated it to Prof. Heller, who has done so much to elucidate the Crustacea of the south of Europe." Preoccupied earlier in the same year among Isopoda. (See *Guernea*, Chevreux), ... 386, 389, 581, 595

Hemityphis, Claus, 1879. ἡμι (in composition) half, *Typhis*, another genus. (? = *Dithyrus*, Dana), ... 491, 591, 1471

Heterelos, Rafinesque, 1815. Probably from ἕτερος and ἦλος, meaning with strange or uneven nails, ... 88

Hexona, Risso, 1826. ? from ἕξ, six. "Thorax sexarticulatus." An Isopod genus placed by Risso among the Læmodipoda, ... 127, **129**

Hiella, Straus-Durckheim, 1828–1829. Proper name (Agassiz). (= *Hyperia*, Latreille), . 134, **139**, 143, 145, 232, 580

Hieraconyx, Guérin, 1836. "From ἱέραξ, ακος, hawk, ὄνυξ, nail." (= *Anchylomera*, M.-Edw.), **164**, 175, 184, 259, 426, 487

Hippias, Rafinesque, 1815. Name of a Greek, ... 88

Hippomedon, A. Boeck, 1870. "Ἱππομέδων, name of a Greek," 393, **397**, 568, 580, **625**

Hircella, Mayer, 1882, suggestion adopted by Haswell, 1885. A feminine diminutive of *hircus*, a he-goat. A genus among the Caprellidæ, ... 535, **564**

Hora, a misspelling of *Aora*, Krøyer, ... 494

Hyale, Rathke, 1837. "Benannt nach einer Nympfe aus dem Gefolge der Diana," . 171, 174, 193, 258, 263, 293, 393, 433, 460, 500, 512, 560, 564

Hyalella, S. I. Smith, 1874. Diminutive of *Hyale*, Rathke. "This genus seems to be closely allied to *Hyale*," 172, 174, 263, **433**, 455

Hyalosoma, Nicol Wagner, 1868. Included by mistake among Amphipoda, ... 387

Hyperia, Latreille and Desmarest, 1823. Hyperia, a fountain at Pheræ in Thessaly, **122**, 127, **137**, 139, 142, 144, 170, 175, 184, 189, 191, 194, 207, 232, 258, 263, **282**, 328, 382, 426, 436, 437, 452, 456, 469, 476, 477, 487, 558, 580, 588, 593, **1377**

Hyperiella, Bovallius, 1887. Diminutive of *Hyperia*, ... **589**, 593, 1403

Hyperiopsis, G. O. Sars, 1885. *Hyperia*, another genus, and ὄψις, appearance, . . . 567, **572**, 576, 1269

Hyperoche, Bovallius, 1887. Closely related to *Hyperia*. (A substitute for *Metoecus*, Krøyer), . 179, **588**, 593, **1398**

Iassa, Leach, 1814. Another spelling of *Jassa*, Leach, ... 86

Ichnopus, A. Costa, 1853. "From the Greek words ιχνος, slender, and πούς, foot." No doubt ἰσχνός, which means "thin," was intended, not ἴχνος, which means a "footstep," . 274, **296**, 393, 580

Ichthyomyzocus, Hesse, 1873. "De ἰχθὺς, poisson ; μύζω, je suce." **417**, 444, 464, 1630

Icilius, Dana, 1849. A Roman of note, ... 228, **229**, **255**, **257**, 265, 580, 582, **1202**

Icillius, misspelling of *Icilius*, Dana, ... 1637

Icridium, Grube (1863), 1864. ἰκρίδιον, diminutive of ἴκρια, cross-benches of a vessel, a cross, . **348**, 441, 580, 582

Iduna, A. Boeck, 1860. In Scandinavian mythology a nymph who kept the golden apples for the rejuvenescence of the gods. Preoccupied for a bird, in 1840, by Keyserling and Blasius. *Liljeborgia*, Sp. Bate, 1862, takes its place, ... 322, **324**, 360, 581

Ione, Latreille, 1817. Not an Amphipod genus, ... 105, 137, 143, 191

Iphigeneia, O. Grimm, 1880, ... 509

Iphigenia, G. M. Thomson, 1881. Ἰφιγένεια, daughter of Agamemnon and Clytemnestra. Preoccupied among the Mollusca by Schumacher in 1817, ... 545, **1637**

Iphimedia, Rathke, 1843. In Greek Ἰφιμέδεια. "*Iphimedia*, habe ich diese nach einer Geliebten Neptuns benannt," 204, 229, **258**, 270, 328, 395, 581 **889**

Isæa, Milne-Edwards, 1830. Mythological name (Agassiz), ... **141**, **176**, 187, 228, 258, 328, 581

Ischyroceras, misspelling of *Ischyrocerus*, Krøyer, ... 228, 284

Ischyrocerus, Krøyer, 1838. "From ἰσχυρός, strong, and κέρας, horn, *i.e.*, furnished with strong horns. I have chosen this name with regard to the strong structure of the antennæ." (=*Podocerus*, Leach), ... **179**, 188, 258, 396, 580

Isocyamus, Gervais and van Beneden, 1859. ἴσος, equal, *Cyamus*, another genus, ... 316, 363

Isoea, misspelling of *Isæa*, Milne-Edwards, ... 184

Isolus, Rafinesque, 1815. Perhaps from ἰσόκωλος, with equal limbs, ... 88

Iulopis, Bovallius, 1887. ἴουλος, down, "body hirsute," **588**

Janassa, A. Boeck, 1870. "Ἰάνασσα, a Nereid," see Homer, Iliad, xviii. 47. Preoccupied, . . 205, 312, 396, **402**

Jassa, Leach, 1814. Mythological name (Agassiz). (=*Podocerus*, Leach), . . **86**, 90, 123, 148, 176, 192, 205 312, 580

Kerguelenia, Stebbing, 1888, ... **1219**

Kröyera, Spence Bate, 1857. "This genus is named in honour of the distinguished Danish naturalist," **293**, **294**, 307, 328, 395, 516 572

Kröyerea, a misspelling of *Kröyera*, Spence Bate, ... 421

Kröyeria and *Kroyeria*, misspelling of *Kröyera*, Spence Bate, ... 294, 348, 561

Kroyera, intended for *Kröyera*, ... 307, 340, 572, 581

Lada, Wrześniowski, 1879. "Lade, in the Slav mythology, represents the goddess of love," . . . **502**

Læmatophilus, misspelling of *Lætmatophilus*, Bruzelius, ... 566

Lætmatophilus, Bruzelius, 1859. "From λαῖτμα and φίλος," meaning "dear to the deep sea," **312**, 396, 580, **1197**

Lætmophilus, misspelling of *Lætmatophilus*, Bruzelius (Scudder, Nom. Zool., p. 166).

Lafystius, Krøyer, 1842. "λαφύστιος, gulosus," gluttonous, ... **199**, 294, 295, 576, 601, 898

Lalaria, Nicolet, 1849. (=*Aora*, Krøyer), ... **231**, 270, 580

Lalasia, misspelling of *Lalaria*, Nicolet, ... 295

Lampra, A. Boeck, 1870. λαμπρός, bright. Preoccupied among the Lepidoptera by Hübner in 1816; among the Coleoptera in 1833; used also in Botany. (=*Tritæta*, Boeck, 1876), ... 395, **401**, 581

Lanceola, Say, 1818. Lanceola, a small lance. "In allusion to the form of the terminal divisions of the caudal appendices," **102**, 123, 142, 232, 426, 557, 580 588, 593, 1269, **1301**

Laothoës, A. Boeck, 1870. "Λαοθόης, a son of Heracles," 395, **401**, 573

Laphystius, altered from *Lafystius*, Krøyer, to correspond with the derivation, . . 228, 258, 292,[1] 395, 436, 450 459, 581

Larunda, Leach, 1815. Daughter of the river-god Almo. Her tongue was cut out by Jupiter on account of her talkativeness. (=*Cyamus*, Latreille), ... 91

Leda, misspelling of *Lada*, Wrześniowski. (Scudder, Nom. Zool., pp. 169, 371.)

Lembos, Spence Bate, 1856–7. λέμβος, a small boat with a sharp prow. (=*Microdeutopus*, Costa), ... **294**, 580

Lepidactylis, Say, 1818. λεπίς, a scale, δάκτυλος, finger. (=*Haustorius*, P. L. S. Müller), . **103**, 123, 143, 228, 258, 262 263, 310, 522, 581, 582

Lepidactylus, misspelling of *Lepidactylis*, Say.

Lepidepecreum, Bate and Westwood, 1868. Probably from λεπίς, a scale, and ἐπίκριον (Latin antenna), a sailyard, alluding to the scale-like process on the upper antenna of the type species, ... **373**, 393, **446**, **686**

Lepleurus, Rafinesque, 1820. λεπίς, a scale, πλευρά, side. "The name means lateral scales," . . . . . **111**,[2] 123, 124

Leplurus, misspelling of *Lepleurus*, Rafinesque, ... 413

Leptocheirus, Zaddach, 1844. "λεπτός, χείρ, which has thin hands," . . . **209**, 226, 336, 395, 580, 582

Leptochirus, misspelling of *Leptocheirus*, Zaddach, ... 228, 258, 279, 561

Leptochela, A. Boeck, 1876. λεπτός, thin, χηλή, claw. See Boeck, De Skand. og Arkt. Amph., p. 190. It is a synonym of *Euonyx*, Norman, 1878, ... **373**, **453**

Leptocotis, Streets, 1878. λεπτός, thin, κοτίς, head, ... **470**, 493, 590, **1593**

Leptomera, Latreille, 1816. λεπτός, thin, μηρός, thigh. (=*Proto*, Leach), . . 95, **119**, 123, 126, 135, 138, 171 175, 182, **183**, 191, 192, 202, 270 **282**, 329, 426

[1] Boeck uses the form *Laphystius* in De Skand. og Arkt. Amph., but in the table of errata adopts *Lafystius*.

[2] On p. 111, line 13, for band read hand.

Leptothoe, Stimpson, 1854. λεπτός, thin, θέω, I run. (=*Mæra*, Leach), ... **277**, 581
Lestrigon, misspelling of *Lestrigonus*, Milne-Edwards, ... 175, 184
Lestrigonius, misspelling of *Lestrigonus*.
Lestrigonus, Milne-Edwards, 1830. Seemingly from Λαιστρυγονες, an ancient savage tribe of Italy and Sicily. (=*Hyperia*, Latreille), ... **142**, 170, 189, 258, 263, 328, 382 426, 456, 469, 473, 580, 1377
Leucothea, mispelling of *Leucothöe*, Leach, ... 170
Leucothöe, Leach, 1813. Leucothoë graiis, Matuta vocabere nostris, Ovid. Fasti., vi. 545, **84**, 86, 90, 122, 148, 176, 184 188, 192, 200, 228, 249, **258**, 283 296, 328, 349, 394, 581, **771**
Liljeborgia, Spence Bate, 1862. "It is named in compliment to Prof. Liljeborg," . . 328, **333**, 360, 394, 565, **980**
Lilljeborgia, A. Boeck, 1870. Altered from *Liljeborgia*, Spence Bate, apparently to suit the spelling of Professor Lilljeborg's name as it appears in his later, changed from that in his earlier, papers, ... 394, 458, 459, 561, 570, 581, 582
Limnoria, Leach, 1814. An Isopod genus, which has been used in error for *Chelura terebrans*, ... 383, 580
Liparis, Bosc, 1802. This word is in Latin the name of an island, of a river, and of an unknown fish. Preoccupied among fishes in 1738. (=*Caprella*, Lamarck), . . . **1618**
Liriope, Rathke, 1843. "Den für sie gewählten Gattungsnamen führte eine Meernymphe, deren Ovid in seinen Metamorphosen (Buch III. Vers 342) gedenkt." The mother of Narcissus. (Not an Amphipod genus, but a parasitic Isopod.) Preoccupied, . . . 204
Lisianassa, a misspelling of *Lysianassa*, ... 183
Lonchomerus, Spence Bate, 1856–7. λόγχη, lance, μηρός, thigh. "Meros of first gnathopod produced into a long spine." (=*Aora*, Krøyer), ... **294**, 259, 580
Lonchomeres, a misspelling of *Lonchomerus*, Spence Bate.
Lusyta, Nardo, 1847. (?=*Ericthonius*, Milne-Edwards), ... 220, **390**, 1157
Lycæa, Dana, 1852, ... **259**, **269**, 431, **492**, 590, 1538 **1563**
Lycæopsis, Claus, 1878–9. *Lycæa*, another genus, ὄψις, appearance; "General form like *Lycæa*," 476, **493**, 589, 598, **1458**
Lycesta, Savigny, 1816. (=*Leucothoe*, Leach), ... 93, 120, 123, 581
Lycianassa, misspelling of *Lysianassa*, Milne-Edwards, ... 281
Lysianassa, Milne-Edwards, 1830. Λυσιάνασσα, a Nereid. Hesiod, Theogonia, 258. Preoccupied among Mollusca in 1826. (See *Lysianax*, 1888), ... **141**, 170, 177, 184, 185, 228, 248 255, 257, 270, 296, 328, **361**, **365** 384, 393, 580, 681
Lysianassina, subgenus, Costa, 1867. Preoccupied as name of a group, ... **368**, 369
Lysianella, G. O. Sars, 1882. Diminutive from *Lysianassa*, another genus, ... **538**
Lysianax, 1888. Substitute for *Lysianassa*, preoccupied, ... **681**
Lysionassa, misprint for *Lysianassa*, ... 176
Macleayia, Haswell, 1880. Probably in compliment to the naturalist, Macleay. The name subsequently changed to *Wyvillea*, ... **514**, 581, 583
Macrocephalus, Spence Bate, 1858. μακρός, long, κεφαλή, head. (=*Rhabdosoma*, Adams and White), ... **307**, 591
Mæra, Leach, 1813. Μαῖρα, a Nereid, mentioned by Homer, Iliad., xviii. 47, . **84**, 86, 90, 122, 192, 229, **258** 263, 299, 386, 395, 569, 581 **1007**, 1649
Mærza, misspelling of *Mæra*, Leach, ... 99
Megalorchestes, variation in the spelling of *Megalorchestia*, ... 246
Megalorchestia, Brandt, 1851. μεγάλη, great, *Orchestia*, another genus. "Ich bezeichne sie nach Maassgabe der Grösse der ihr zum Grunde liegenden Art als *Megalorchestia*." (=*Orchestoidea*, Nicolet), ... **246**, 262, 295
Megamæra, A. Boeck, alteration of *Megamæra*, Spence Bate's genus, no doubt in order to make it tally with the spelling of *Mæra*, Leach, from which it is obviously derived, . . . 581
Megamdera, misspelling of *Megamæra*, Spence Bate, ... 494
Megamœra, Spence Bate, 1862. μέγας, great, *Mœra*, another genus. (Doubtfully distinct from *Mæra*, Leach), ... 229, 328, **335**, 386
Megamphopus, Norman, 1869. "μέγας, great, ἄμφω, both, πούς, a foot." (?=*Podoceropsis*, Boeck), ... 1108, **1628**
Melita, Leach, 1813. Μελίτη, a Nereid. Hesiod, Theogonia, 246, . . . **84**, 86, 90, 122, 148, 176, 192 222, 229, **258**, 263, 296, 297, 299 328, 378, 395, 502, 569, 581

Melphidippa, A. Boeck, 1870. "Melphidippa, a maid-servant in Plantus," probably referring to Milphidippa, a maid-servant in the Miles gloriosus, . . . 357, 395, **402**, 581
Menigrates, A. Boeck, 1870. "Μενιγράτης, name of a Greek," 321, **398**, 580
Metœchus, misspelling of *Metœcus*, Krøyer.
Metœcus, Krøyer, 1838. "μέτοικος, inquilinus, an inmate, or one who resides with another." Preoccupied in 1833 among Coleoptera. (See *Hyperoche*, Bovallius), . **179**, 189, 258, 263, 268, 558, 580, 1398
Metoicus, misspelling of *Metœcus*, Krøyer, ... 317
Metopa, A. Boeck, 1870. "Μετόπα, a proper name," 200, 293, 394, **400**, 569, 581, **752**
Microcheles, Krøyer, 1846. μικρός, small, χηλή, a claw. (=*Iphimedia*, Rathke), . . 205, **216**, 229, 258, 581, 582
Microdentopus, misspelling of *Microdeutopus*, Costa, ... 334, 369, 1636
Microdeuteropus, altered from *Microdeutopus*, Costa, to tally with the derivation, . . . 370, 434, 459, 551, 562
Microdeutopus, A. Costa, 1853. "From the Greek words μεκρος, little, δευτος, second, and πούς, foot." It is clear that the words μικρός and δεύτερος were intended, . **274**, 294, 296, **299**, 350, 396, 520, 580
Microplax, Lilljeborg, 1865. μικρός, little, πλάξ, a flat surface. Preoccupied among Hemiptera, 1861. (=*Liljeborgia*, Sp. Bate), ... 360, 581
Microprotopus, Norman, 1867. μικρός, little, πρῶτος, first, πούς, foot. "Second gnathopods larger than first," **370**, 396, 580
Mimonectes, Bovallius, 1885. "Derivatio, Μῖμος: mimic, imitator, and νήκτης: swimmer," . **558**, 580, 588, 593
Mœra, misspelling of *Mæra*, Leach, ... 176, 328, 335, 1649
Monoculodes, Stimpson, 1853. *Monoculus*, one-eyed (a hybrid word from μόνος, single, and oculus, eye), εἶδος, appearance, ... **278**, 294, 328, 394, 516, 572, 581
Montagua, Spence Bate, 1856–7. "This genus is named after Colonel Montagu, who was a worthy pioneer in this branch of Zoology, and the discoverer of the first species." Preoccupied. (=*Stenothoe*, Dana, and *Metopa*, Boeck), ... 290, **293**, 328, 394, 581
Montaguana, Chilton, 1882. Altered from *Montagua*, Spence Bate, ... 551
Mulleria, Leach, in Desmarest, 1825. A synonym of *Mæra*, Leach. Probably in honour of O. F. Müller, ... 122
Næara, mentioned by Kinahan, 1863, as if an Amphipod genus; the species *Næara bicuspidata*, being perhaps named by some confusion for the Isopod *Næsa bidentata*. Preoccupied in 1840, ... 344
Nænia, Spence Bate, 1862. The Goddess of dirges, in Mythology. Preoccupied in 1829, . . **336**, 396, 580, 1108
Natalius, A. Costa, 1864. "In memory of Giuseppe De Natale, a young Naturalist of Messina," **346**, 561
Naupredia, Latreille, 1829. (?=*Proto*, Leach), ... **138**, 144,[1] 183, 192, 202, 329
Naupridia, misspelling of *Naupredia*, Latreille, ... 191, 426
Necrogammarus, Woodward, 1870. "From νεκρός, dead, and proper name," **409**, 472
Nemertes, Leach, MS., White, 1847. Νημερτής, a Nereid, Hesiod, Theogonia, 263. (=*Chelura*, Philippi), ... 220, 223, 580
Neobule, Haswell, 1880. The name of a girl, in Horace, Odes, III. 12.5, ... **511**, 533, 564
Neohela, S. I. Smith, 1881. "*Neohela*, nom. nov., vice *Hela*, Boeck, præoc.," . . . 322, 396, 530, 581, 1215
Nicea, Nicolet, 1849. (=*Hyale*, Rathke), ... 172, **231**, 233, 263, 293, 328, **365**, 380, 501, 519, **560**
Nicippe, Bruzelius, 1859. "Name of a daughter of Pelops," **315**, 394, 581
Niphargus, Schiødte, 1849–1851. νίφαργος, snow-white, ... 220, 233, **234**, 270, 391, 311, 328, 350, 378, 395, 413, 494, 510, 581, 1656
Noenia, misspelling of *Nænia*, Spence Bate, ... 446
Normania, A. Boeck, 1870. "Named after the English Zoologist, Rev. A. M. Norman," . 393, **399**, 576, 580, 582, 601
Nototropis, A. Costa, 1853. "From the Greek words νῶτος, back, and τρόπις, keel." (=*Atylus*, Leach), ... 250, 274, 296, **297**, 581
Notrotopis, misspelling of *Nototropis*, Costa, ... 274
Nymphon, Fabricius. νυμφών, a bridal chamber. This genus, wrongly included by Risso among the Læmodipoda, does not belong to that or any other Amphipod-group, . . . 129
Odius, Lilljeborg, 1865. Altered from *Otus*, Spence Bate, preoccupied, ... **333**, 360, 395, 581
Œdiceroides, Stebbing, 1888, ... 461, 547, **843**
Œdiceropsis, Lilljeborg, 1865. *Œdiceros*, another genus, ὄψις, appearance, ... **361**, 395, 461, 581
Œdiceros, Krøyer, 1842. "οἰδέω, tumeo, et κέρας, cornu," **199**, 394, 569, **837**
Œdicerus, misspelling of *Œdiceros*, Krøyer, ... 228, 255, 258, 288, 315, **516**, 581
Onchomene, a misprint for *Orchomene*.

[1] On p. 144, line 17, for *Nempredia*, read *Naupredia*.

Onesimoides, Stebbing, 1888, ... 647
Onesimus, A. Boeck, 1872, corrected spelling of *Onisimus*, ... 215, 393, 509, 510, 568
Onidium, Parkinson, MS., 1768, ... 1329, 1617
Oniscus, Linnæus, 1735, ὀνίσκος, a little ass, a wood-louse. Not properly an Amphipod genus, though in the early authors it from time to time gave its name to various Amphipoda, . . . 11,40
Onisimus, A. Boeck, 1870, altered afterwards by Boeck to *Onesimus*, from "Ονήσιμος, a Greek man's name." (?= *Alibrotus*, Milne-Edwards), ... 393, **398**, 568
Opis, Krøyer, 1842. "*Opis* nomen virginis Hyperboreæ, cujus in Melpomene (cap. 33) mentionem facit *Herodotus*." Preoccupied among Mollusca, 1825. (See *Opisa*, Boeck), **198**, 228, 257, 283, 393, 580, 582
Opisa, A. Boeck, 1876. "'Ωπισα, a girl in Herodotus." (Instead of *Opis*, preoccupied), ... 393, **453**
Orattrina, de Natale, 1850. ? from *orata*, a goldfish, and *trina*, trilobed (W. Stebbing), . . . 248, **1622**
Orattrino, misspelling of *Orattrina*, de Natale, ... 1624
Orchestes, misspelling of *Orchestia*, Leach, ... 457
Orchestia, Leach, 1813. ὀρχηστής, a dancer, ... 3, 84, **90**, 122, 126, 148, 170, 176, 184, 185, 191, 194, 226, 228, **235**, **244**, 248, 254, **257**, **262**, 265, 283, 291, 395, 296, 313, 328, 380, 384, 393, 477, 515, 554, **602**, 1636
Orchestia, Brandt, 1851, a subgenus of *Orchestia*, ... **245**
Orchestia, Dana, 1852, a subgenus of *Orchestia*, ... **257**, 262
Orchestoidea, Nicolet, 1849. *Orchestia*, another genus, εἶδος, appearance, ... **231**, 262, 295
Orchomena, misspelling of *Orchomene*, Boeck. (Scudder, Nom. Zool., p. 222.)
Orchomene, A. Boeck, 1870. "'Ορχομένη, a town." The name as found in sundry Greek towns is 'Ορχόμενος, ... 215, 321, 393, **399**, 446, 580, 673, 676
Orchostoidea, misspelling of *Orchestoidea*, Nicolet. (Scudder, Nom. Zool., p. 222.)
Orio, Cocco, 1832. "Un nuovo genere di crustacei, che vo appellare dal nome del primo fondatore di Messina *Orione*." (In exchange for *Charybdis*, preoccupied), . . **145**, **150**, 152, 240, 248, 492, 562
Orione, the vernacular name of *Orio*, Cocco, ... 190, 426
Ornithoramphus, de Natale, 1850. ὄρνις, a bird, ῥάμφος, a beak, ... **239**, 248, 493
Ornithorhamphus, another spelling of *Ornithoramphus*, de Natale, ... 369, 561, 562
Orthopalame, Hoek, 1879. "From ὀρθός, straight, and παλάμη, palm," **496**
Otus, Spence Bate, 1862. "From the close approximation of this genus to the preceding [*i.e.*, *Iphimedia*], I have chosen for its name that of the son of Iphimedia." Preoccupied among birds, Cuvier, 1799–1800. (See *Odius*, Lilljeborg), ... 328, **333**, 360, 395, 581
Oxycephalus, Milne-Edwards, 1830. ὀξυκέφαλος, with pointed head, . . . **143**, 171, 175, 184, 190, **232**, 236, 241, 259, 327, 347, 452, 470, 476, **493**, 553, 561, 590, **1576**
Palæocrangon, Schauroth, 1854. παλαιός, of a past age, κραγγών, another Crustacean genus, . . . 277, 508[1]
Palæogammarus, Zaddach, 1864. παλαιός, of a past age, *Gammarus*, another Amphipod genus, ... **353**
Pallasea, Spence Bate, 1862. Named after Pallas the Zoologist. (One of the Diptera was named *Pallasia*, in 1830, by Robineau-Desvoidy, and an Isopod was named *Pallasius*, in 1825, by Leach, according to Desmarest), ... 33, 309, **335**, 372, 395, 581
Pallasia, alteration of *Pallasea*, Spence Bate, ... 33, 395, 465
Panope, Leach, 1813. Πανόπη, a Nereid, Hesiod, Theogonia, 250. (= *Cyamus*, Latreille), ... **85**
Pandora, O. Grimm, 1880. Preoccupied, ... 509
Pantoporeia, O. Grimm, 1880. ? for *Pontoporeia*, ... 509
Panoplæa, G. M. Thomson, 1880. Πάνοπλος, in full armour; the genus "so named from the coat-of-mail which envelopes the first-discovered form." Trans. New Zealand Inst., xiii. p. 213, ... **524**
Panoploea, G. M. Thomson, 1880. Alternative spelling of *Panoplæa*, ... 524
Paradryope, Stebbing, 1888, ... **1151**
Paradulichia, A. Boeck, 1870. "παρά, near to, *Dulichia*," another genus, ... 396, **402**, 580
Paralycæa, Claus, 1879. παρά, near to, *Lycæa*, another genus, ... **493**, 590, **1567**
Paramæra, variation from *Paramœra*, Miers. (Scudder, Nom. Zool., p. 232.)
Paramœra, Miers, 1875. παρά, near to, *Mœra*, misspelling of another genus, ... **447**, 458, 913, 1654
Paramphithoe, Bruzelius. 1858. παρά, near to, *Amphithoë*, another genus, . . . **313**, 314, 356, 395, **425**, 569, 581, 582

[1] The Carboniferous *Palæoncragon* mentioned on p. 508 is perhaps distinct from Schauroth's Permian genus, but whether an earlier or later name I have not discovered.

Paramphitoe, misspelling of *Paramphithoe*, Bruzelius, ... 546
Paranænia, Chilton, 1883. *πάρα*, near to, *Nænia*, another genus. (?=*Gammaropsis*, Lilljeborg), ... **550**, 1092
Paraphronima, Claus, 1879. *παρά*, near to, *Phronima*, another genus, . . 264, 338, 476, **488**, 558, 588, 1269, **1335**
Parapleustes, Buchholz, 1874. *παρά*, near to, *Pleustes*, another genus, ... **424**
Parapronoë, Claus, 1879. *παρά*, near to, *Pronoe*, another genus, ... **492**, 591, **1521**
Parascellus, misspelling of *Parascelus*, Claus. (Scudder, Nom. Zool., p. 248), ... 1496
Parascelus, Claus, 1879. *παρά*, *σκέλος*, leg, ... **492**, 591, **1496**
Parathemisto, A. Boeck, 1870. "*παρά*, beside and *Θεμιστώ*, a Nereid," or rather, *παρά*, near to, *Themisto*, another genus, ... 393, **397**, 473,[1] 580, 588, 593, 1419
Paratyphes, alteration of *Paratyphis*, Claus, ... 591
Paratyphis, Claus, 1879. *παρά*, near to, *Typhis*, another genus, ... **491**, 591
Pardalisca, Krøyer, 1842. "Nomen ancillæ apud Plautum in Casina," . . **199**, 228, 258, 394, 581, **991**, **1476**
Parelasmopus, Stebbing, 1888, ... **1029**
Pariambus, 1888. (In exchange for *Podalirius*, Krøyer, preoccupied), ... 1268
Pediculus, ancient comprehensive genus; used by Seba in 1734 to include the Whale-louse, afterwards named *Cyamus*, ... 11
Peltocoxa, Catta, 1875. Pelta, a shield, coxa, name given to the true first joint of the leg in Amphipoda, ... 441, 513, 539, 1574, 581
Pephredo, Rafinesque, 1815–1817. "The name is mythological," 88, **100**
Pereionotus, Bate and Westwood, 1862. Pereion, Spence Bate's name for the central portion of an Amphipod, *νῶτος*, back. "Pereion distended," . . . **340**, 580, 582
Phædra, Spence Bate, 1858. A girl in the Aulularia of Plautus, also, a daughter of Minos in mythology. Preoccupied, ... **311**, 328, 581
Phasmatocarcinus, Tilesius, 1819. *φάσμα*, a phantom, *καρκίνος*, a crab. Not an Amphipod genus, . 109, 135, 148, 149
Phersua, misspelling of *Pherusa*, Leach, ... 494
Pherusa, Leach, 1814. *Φέρουσα*, a Nereid, Hesiod, Theogonia, 248, . . 86, **90**, 123, 125, 144, 148, 192, 229, 270, 328, 378, 560, 581, 913
Philius, mistake for *Phlias*, Guérin, ... 426
Phlias, Guérin, 1836. "*Phlias*, one of the Argonauts," **165**, 176, 184, 186, 228, 257, 296, 341, 348, 551, 580
Phocus, misspelling of *Phoxus*, Krøyer, ... 494
Phorcorrhaphis, 1888, altered from *Phorcus*, Milne-Edwards, preoccupied, ... **1451**
Phorcus, Milne-Edwards, 1830. A son of Neptune. Preoccupied. (See *Phorcorrhaphis*), **142**, 170, 175, 184, 189, 259, 493, 580, 589
Photis, Krøyer, 1842. "Nomen ancillæ apud *Apuleium* in Asino aureo," . . **199**, 228, 258, 341, 396, 581, 597, **1063**
Phoxocephalus, 1888, altered from *Phoxus*, preoccupied, ... **810**
Phoxus, Krøyer, 1842. "*Φοξός*, capite acuto. *Ιλιαδος*, B, 219; *φοξὸς ἔην κεφαλήν, κ. τ. λ.*" Preoccupied. (See *Phoxocephalus*), ... **198**, 228, 258, 328, 394, 568, 581, 810
Phreatoicus, Chilton, 1882. *φρέαρ*, *φρέατος*, a well, *οἶκος*, a dwelling. (Allied to the Amphipoda, if not an Amphipod), ... **543**, 587
Phronima, Latreille, 1803. *φρόνιμος*, prudent. "Ce nom grec répond à notre adjectif *prudent*, et convient sans doute à un animal qui, pour garantir sa foiblesse naturelle, a la sage précaution de s'envelopper d'un corps gélatineux, n'ayant aucune indice extérieure de vitalité et qui ne réveille point ainsi l'appétit carnassier de ses ennemis." Latr., Hist. Nat., tome vi. p. 289, ... **72**, **78**, 84, 88, 89, 96, 97, 122, 134, 135, 137, 143, 144, 148, 170, 175, 184, 190, 191, 248, 259, 272, 307, 316, 328, 338, 350, 429, 436, 438, 439, 452, 469, 476, **487**, 553, 562, 566, 589, 597, 1269, 1346
Phronimatopsis, variation from *Phronimopsis*, Claus. (Scudder, Nom. Zool., pp. 375, 244.)
Phronime, misspelling of *Phronima*, Latreille, ... 87
Phronimella, Claus, 1871. Diminutive from *Phronima*, another genus, . . 339, 405, 476, **487**, **542**, 589, 1269, 1361
Phronimopsis, Claus, 1878–9. *Phronima*, another genus, *ὄψις*, appearance, . . . 476, **488**, 589, **1373**
Phronoma, misspelling of *Phronima*, Latreille, ... 290
Phronyma, misspelling of *Phronima*, Latreille, ... 81, 91, 95, 107, 477

[1] On p. 473, line 7, for *Parathemists* read *Parathemisto*.

Phrosina, Risso, 1822. ? from Εὐφροσύνη (cheerfulness), one of the Graces, Hesiod, Theogonia, 900. Costa says, "the name *Frosine*, assigned to this genus by Risso, is derived from the Latin word *Phrosine*, which means *cheerful*, according to Voss. The author chose this name with a view to the beautiful violet shot with gold, which adorns the pearly white of this Crustacean." Phrosine does not appear as a Latin word in ordinary lexicons, ... **117**, 127, **128**, 137, 175, 190, 248 476, 487, 589

Phrosine, spelling of *Phrosina*, Risso, in Desmarest, 1825, Hope's Catalogue, &c., . . 122, 144, 183, 191, 259, 272, 349 1424

Phtisica, Slabber, 1769, ... 32

Pisitoe, Rafinesque, 1814, ... **87**, 88, 123, 272

Pisitooë, misspelling of *Pisitoe*, Rafinesque, ... 190

Platamon, Stebbing, 1888, ... **642**

Platophium, Dana, 1852. No doubt from πλατύς, broad, in allusion to the dorsal breadth of the peræon at the centre, the termination *ophium* pointing to the connection between this genus and *Corophium*, Latreille, ... **257**, 261, 265, 500, 521, 566, 580 581, **1184**

Platycyamus, Lütken, 1870. πλατύς, broad, *Cyamus*, another genus, . . . 282, 397, **402**, **419**, **1226**

Platyischnopus, Stebbing, 1888, ... **830**

Platyscelus, Spence Bate, 1861. "πλατύς, broadly dilated ; σκέλος, leg," . . **327**, 337, 470 476 490, 1269 1462

Pleonexes, Spence Bate, 1856–7. ? πλεονέκτης, one who is grasping. "Posterior pereiopoda prehensile." (= *Sunamphithoë*, Spence Bate), ... **294**, 580, 582

Pleustes, Spence Bate, 1858. πλευστικός, fit for sailing, ... 179, **308**, 395, 569 581 **870**

Plexaura, Rafinesque, 1815. ? from πλῆξις, a stroke, οὐρά, tail, ... 88

Podalirius, Krøyer, 1845. Ποδαλείριος, a son of Æsculapius ; a name derived from πούς, a foot, and λειρός, thin, and therefore very applicable to this genus. Krøyer says "the name refers to the rudimentary condition of the legs of the fifth segment (λειρος, gracilis)." (See *Pariambus*), ... **210**, 256, 397, 535, 537

Podoceropsis, A. Boeck, 1870. "*Podoceros*, ὄψις, appearance," 322, **324**, 396, **1108**

Podoceros, Goës, 1865. A variation in the spelling of *Podocerus*, Leach, to suit the derivation, . . 358, 390, 580

Podocerus, Leach, 1814. πούς, foot, κέρας, horn, antenna, ... **86**, 90, 123, 148, 170, 176, 184 189, 192, 219, 228, 257, 261, **283** 296, 298, 307, 312, 328, 375, 396 570, 580, **1129**

Podura, Linnæus, 1740. πούς, a foot, οὐρά, a tail. (Used by Poda, 1761, in describing what is probably an *Orchestia*), ... 20

Polycheria, Haswell, 1880. πολυχειρία, a multitude of hands. "Pereiopoda all prehensile." (= *Tritæta*, Boeck), ... 451, **513**, 514, 581, 583

Pontiporeia, misspelling of *Pontoporeia*, Krøyer, ... 258

Pontocrates, A. Boeck, 1870. "πόντος, sea, κρατέω, I rule," 294, 307, 395, **400**, 572, 581

Pontogeneia, A. Boeck, 1870. "ποντογένεια, sprung from the sea," 395, **401**, 581

Pontogenia, misspelling of *Pontogeneia*, Boeck, ... 546

Pontoparéia, misspelling of *Pontoporeia*, Krøyer, ... 301

Pontoporeia, Krøyer, 1842. "Πυντοπόρεια (pontivaga), Nomen Nereidis Apud Hesiodum (Theogon. vers. 256)." **198**, 228, 384, 393, 580, 582 1644

Pontoporeja, misspelling of *Pontoporeia*, Krøyer, ... 296

Pontoporia, misspelling of *Pontoporeia*, Krøyer, ... 408

Praniza, Leach, MS. Not distinct from *Anceus*, which is generally considered an Isopod genus, ... 192

Primno, Guérin, 1836. "*Primno*, nymphe, fille de l'Océan," in Greek Πρυμνώ, see Hesiod, Theogonia, 350. Rafinesque's genus *Primno*, among the Oniscia, 1815, was left undescribed, ... **164**, 175, 184, 189, 232, 259, 487 589, 1440

Prinassus, Hansen, 1887. "Πρινασσός, name of a Greek town," **1644**

Priscilla, A. Boeck, 1870. "Πρισκιλλα, a Greek woman's name." It is, however, very clearly not a Greek but a Latin name, diminutive of prisca, old-fashioned. Preoccupied. (See *Priscillina*), ... 322, 393, **399**, 580, 582, 1644

Priscillina, 1888. (In exchange for *Priscilla*, Boeck, preoccupied.)

Probolium, A. Costa, 1857. "From the Greek word προβόλιον, loricula, a little cuirass." (= *Stenothoe*, Dana), ... 274, 293, 296, **297**, 322, 380, 460 560, 581

Pronoe, Guérin, 1836. "*Pronoe*, nymphe, fille de Nérée." Hesiod, Theogonia, 261, **165**, 175, 184, 190, 232, 236, 241 **259**, 269, **492**, 591, **1507**

Prosoponiscus, Kirkby, 1857. "From πρόσωπον, a face or mask, and ὀνίσκος, oniscus." A synonym of *Palæocrangon*, Schauroth, ... 300, 472, 521

Protella, Dana, 1852. Diminutive of *Proto*, another genus, ... **256**, **265**, 328, 375, 535, 537, **1244**

Protellopsis, Stebbing, 1888, ... **1240**

Proto, Leach, 1814. Πρωτώ, a Nereid, Hesiod, Theogonia, 243, ... **86**, **90**, **119**, 157, 202, 256, 265, 270, 328, 396, 535, 537, **1228**

Protogeneia, a misprint for *Pontogeneia*.

Protomedeia, Krøyer, 1842. "Πρωτομέδεια, filia *Nerei* et *Doridis*. Hesiod, Theogonia, vers. 249," **186**, **199**, 228, 258, 366, 396, 561, 580

Protomedia, misspelling of *Protomedeia*, Krøyer, and given by mistake for *Proto*, Leach, ... 328, 494

Proton, Desmarest's spelling of *Proto*, Leach, ... 95, 123, 126, 171

Protonia, Rafinesque, 1815, ... 88, 126

Psammylla, Rafinesque, 1817. ψάμμος, sand, ψύλλα, a flea. "The name is abbreviated from Psammopsylla, which means sand-flea." Probably a synonym among the Orchestidæ, . . . **99**

Pseudolycæa, Claus, 1879. ψευδο-, in composition, unreal, simulating, *Lycæa*, another genus, . . . **493**, 590

Pseudophthalmus, altered spelling of *Pseudopthalmus*, Stimpson, to suit the derivation, . . 279, 295, 332, 581

Pseudopthalmus, Stimpson, 1854. ψευδής, false, ὀφθαλμός, eye. (= *Ampelisca*, Krøyer), ... **279**

Pterygocera, a new spelling of *Pterygocerus* adopted by Latreille in 1829, . . . 138, 143, 192, 228, 257, 261, **474**, 581

Pterygocerus, Latreille, 1825. πτέρυξ, wing, κέρας, horn, antenna. "Ses quatre antennes sont très-garnies de poils barbus ou formant des pinnules aux premiers articles." (= *Haustorius*, P. L. S. Müller), ... 125, **126**

Ptilocheirus, Stimpson, 1854. πτίλον, feather, down, χείρ, hand. (? = *Leptocheirus*, Zaddach), . **279**, 366, 466, 580

Ptilochirus, misspelling of *Ptilocheirus*, Stimpson, ... 561

Pulex, ancient comprehensive genus, ... 3, 4, 9

Pychnogonum, misspelling of *Pycnogonum*, Brünnich, ... 209

Pycnogonum, Brünnich, 1764. πυκνός, frequent, γωνία, angle, "novum genus, quod e crebris articulationibus *Pycnogonum* dico." A genus not belonging to the Amphipoda except as a synonym of *Cyamus*, Latreille, ... **26**, fig. 10, 29, 1618

Pyctilus, Dana, 1852. "The name of the genus *Pyctilus* is from πυκτης, a boxer, and alludes to the very large and well-formed hands of the species." (? = *Eriethonius*, Milne-Edwards), ... 255, **258**, **267**, 268, 375, 559, 580

Pygnogonum, misspelling of *Pycnogonum*, Brünnich, ... 129

Reptorramphus, error or intended correction for *Erpetoramphus*, de Natale, ... 1624

Rhabdonectes,[1] Bovallius, 1887. ῥάβδος, a rod, νήκτης, a swimmer. (= *Rhabdosoma*, Adams and White), ... **591**, 1606

Rhabdosoma, Adams and White, 1848. ῥάβδος, rod, σῶμα, body, ... 191, 224, **225**, 259, 327, 452, **493**, 553, 591, 598, **1606**

Rhachotropis, S. I. Smith, 1883. "Ῥάχις et τρόπις, nom. nov., vice *Tritropis*, Boeck, præoc." ῥάχις, ridge of the back, τρόπις, keel. (See *Amphithonotus* and *Tritropis*), . . 394, 546, 954

Rhœa, Milne-Edwards 1828, ? from rhœa, wild poppy. A synonym of *Apseudes*, Leach, not generally considered an Amphipod genus, ... 127, **134**

Sannazaria, O. G. Costa and A. Costa, 1840. Apparently named after Sannazarius, a writer of piscatory eclogues; see Johnson, Rambler, July 21, 1750, ... 183, 249

Scamballa, Leach, MS., White, 1847. ? from scambus, bow-legged. (= *Orchestia*, Leach), . . . 222, 245

Schizoscelus, Claus, 1879. σχίζω, I split, σκέλος, leg; in allusion to the slit in the femoral-plate (first joint) of the fourth peræopods, ... **491**, 591, **1503**

Schnehagenia, Claus, 1871. Named after Captain Schnehagen. (= *Brachyscelus*, Sp. Bate), . 337, 406, 492, 1543

Schraderia, Pfeffer, 1888, ... 1653, 1654

Scinà, Prestandrea, 1833. "Ho voluto dedicarlo al dottissimo abbate Cav. Domenico Scinà, qual celebre conoscitore delle scienze naturali," **154**, 249, **1270**

Scopelocheirus, Spence Bate, 1856–7. Seemingly from σκόπελος, a high rock, and χείρ, hand; but as White, Hist. Brit. Crust., p. 168, says "First pair of jaw-feet ending in a brush," "Hence the generic name, from σκοπηλος, a brush, and χειρ, the hand," it may be inferred that it is in reality a hybrid from Latin scopula, a little broom, and Greek χείρ, hand; σκοπηλος being an imaginary word. (= *Callisoma*, Costa), . . 290, **293**, 580

Seba, Spence Bate,[2] 1862. After Seba, the eminent naturalist, ... 18, **334**, 451, 550, 560, 581, 782, 1624

[1] The name *Rhabdonectes* was given under the impression that *Rhabdosoma*, Adams and White, was a preoccupied name, but so far as I can discover, the ophidian genus to which Bovallius alludes has a later date and a different spelling, being *Rabdosoma*, Duméril, 1853.

[2] Spence Bate does not claim this genus as his own, but A. Costa, to whom he assigns it, has definitely disowned it, see Note on de Natale, 1850 (in Appendix, p. 1624).

Siljeborgia, misprint for *Liljeborgia*, ... 473
Simorhynchotus, 1888. New name for *Simorhynchus*, preoccupied, ... **1572**
Simorhynchus, Claus, 1871. σιμός, flat-nosed, ῥύγχος, beak. Preoccupied, . . . 406, **493**, 590, 597, 1572
Siphondecetes, misspelling of *Siphonœcetes*, Krøyer, ... 494
Siphonocœtes, misspelling of *Siphonœcetes*, Krøyer, ... 302, 518, 1634
Siphonœcetes, Krøyer, 1845. "σίφων, a tube, οἰκέτης, an inmate," . . . **212**, 229, 256, 307, 396, 580
Siphonœcetus, misspelliug of *Siphonœcetes*, Krøyer, ... 396, 430
Siphonocetus,[1] misspelling of *Siphonœcetes*, Krøyer, ... 290, 292, 295
Siphonocœtus, misspelling of *Siphonœcetes*, Krøyer, ... 328
Sirenocyamus, J F. Brandt, 1847. Σειρήν, a siren, and *Cyamus*, another genus, . . . 15, 218, **227**
Socarnes, A. Boeck, 1870. "Σωκαρνής, name of a Greek," 177, 225, 393, **397**, 568, 580, 690
Socarnoides, Stebbing, 1888, ... **690**
Sophrosyne, Stebbing, 1888, ... 607, **652**
Sperchius, Rafinesque, 1820. "The name was that of an ancient fluviatile God of Thessaly," **110**, 123, 143, 190, 426
Spinifer, Holbøll, MS., 1842, ... 198
Squilla, ancient comprehensive genus, ... **12**, 13, 16, **19**, 134, 135, 148
Stebbingia, Pfeffer, 1888, ... 1653, **1654**
Stegocephalus, Krøyer, 1842. "στέγω, tego, et κεφαλή, caput," . . . **198**, 228, 257, 394, 450, 580, 728
Stegoplax, G. O. Sars, 1882. στέγω, I cover, πλάξ, a flat surface. "The enormous development of the 3d and 4th pairs of Epimera is characteristic." (Perhaps = *Peltocoxa*, Catta), ... 441, 513, **539**, 574
Stenia, Dana, 1849. Perhaps from στενός, narrow. Preoccupied, ... 228, **229**, 255, 257
Stenopleura, Stebbing, 1888, ... **949**
Stenothoe, Dana, 1852. Probably from στενός, narrow, and the termination *-thoë* found in some other genera; Dana says "the slender maxillipeds without the inner lamellar processes and the non-palpigerous mandibles, are alone sufficient to mark this genus as distinct from others to which it is related," **257**, 293, 322, 394, 560, 581, 582 **748**
Steryolus, Rafinesque, 1815, ... 88
Stimpsonia, Spence Bate, 1862. "The name given to this genus is in compliment to the industrious and intelligent naturalist of the United States' Exploring Expedition in the North Pacific." Preoccupied among *Vermes*, 1848, ... 328, **334**, 520, 580, 582
Streetsia, Stebbing, 1888, ... **1603**
Stygobromus, Cope, 1872. Στύξ, the river of Hades, βρόμος, roaring. A genus from the Mammoth Cave, Kentucky. A synonym of *Crangonyx*, according to S. I. Smith, 1875, . . 406, **413**
Stygodromus, misspelling of *Stygobromus*, Cope. (Scudder, Nom. Zool., p. 306.)
Sulcator, Spence Bate, 1854. "The name being derived from the furrow which it makes in the wet sand when crawling." = (*Haustorius*, P. L. S. Müller), . . 244, 283, 290, 328, 394, 581 1624
Sunamphitoë, Spence Bate, 1856–7. σύν, with, *Amphitoë*, another genus, ... 263, **294**
Sunamphithoë, Spence Bate, 1862, altered spelling of *Sunamphitoë*, to correspond with *Amphithoë*, to which it is so closely allied, ... 328, **376**, 396, **1115**
Sympronoë, Stebbing, 1888, ... **1533**
Synamphithoë, White, 1857. A change in the spelling of *Sunamphitoë*, to correspond with the general practice of latinizing Greek words, ... 305, 580
Synopia, Dana, 1852. From σύν, together, ὤψ, eye. "Pigmentum oculorum unicum," **259**, 264, **268**, 406, 517, 576, **799**
Synopioides, Stebbing, 1888, ... **999**
Synurella, Wrześniowski, 1877. σύν, together, οὐρά, a tail. No proper generic description was given in 1877, and on philological grounds the name was afterwards changed to *Goplana* by Wrześniowski, ... 472
Syrrhoë, Goës, 1865. συρροή, a flowing together, conflux, ... **357**, 386, 394, 581, **788**
Talitronus, Dana, 1850. "*Talitro* pedes primos antennasque similis." (= *Orchestoidea*, Nicolet), . . . **235**, **254**
Talitrorchestia? J. F. Brandt, 1851. A subgenus of *Talitrus*. *Talitrus* and *Orchestia*, two genera of Amphipods, ... 244, 245
Talitrus, Latreille and Bosc, 1802. Talitrum, a fillip with the finger, in French chiquenaude. "Ils donnent, si on peut employer cette expression, de continuelles chiquenodes au sol sur lequel ils se trouvent," Bosc, ... **67**, **72**, **78**, 79, 84, 88, **90**, 96 99, 114, 122, 126, 135, 147, 148 170, **176**, 184, 185, 192, 226, 228 **235**, **244**, 248, **254**, **262**, 280 283, 295, 296, 328, 384, 393

[1] On p. 292, last line, for *Siphonocetu* read *Siphonocetus*.

Talitrus, Dana, 1852. A subgenus of *Orchestia*, ... 257, 262
Talorchestia, Dana, 1852. A subgenus of *Orchestia*, adopted by Spence Bate, 1862, as an independent genus. *Talitrus* and *Orchestia*, two other genera, ... **257**, 262, 265
Talytrus, a misspelling of *Talitrus*, ... 183, 275
Tanais, Milne-Edwards, 1828. Not usually considered an Amphipod genus, ... 201, 527, 544, 549, 579
Tanyscelus, Claus, 1879. τανυ-, in composition, long, outstretched, σκέλος, leg. (= *Thyropus*, Dana), ... **492**, 591, **1492**
Tauria, Dana, 1852. A proper name (Boeck), ... **258**, 263, **268**, 558, 580, 588
Temisto, misspelling of *Themisto*, Guérin, ... 302
Teraticum, Chilton, 1883. τερατικόν, a strange thing. (= *Seba*), ... 451, **550**
Tessarops, Norman, 1868. τέσσαρες, four, ὤψ, eye. "Eyes four." (= *Tiron*, Lilljeborg), ... **386**, 581
Tetrathyrus, Claus, 1879. τετράθυρος, with four doors, ... **491**, 591, **1480**
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[1] On p. 423, line 17, *for* 1879 *read* 1876.

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Xenoclea, A. Boeck, 1870. "*Ξενόκλεια*, a Delphic priestess." (See *Podoceropsis*), . . 396, **402**, 580, 1062, **1108**

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[1] My friend Mr. William Bradford of New York informs me that Rafinesque-Schmaltz used sometimes the name Rafinesque and sometimes the name Schmaltz to suit his varying circumstances, but that, though he had a right to both names, he never used them in combination.

[2] In Nardo's Adriatic Crustacea, 1869 (see p. 389), the names of several genera are wrongly spelt; thus, *Lisianassa* for *Lysianassa*, *Amphitonotus* for *Amphithonotus*, *Gamarus* for *Gammarus*, *Lemothoe* for *Leucothoe*, *Calomastix* for *Colomastix*, *Amphitae* for *Amphithoe*, *Magamoera* for *Megamoera*, *Gamarella* for *Gammarella*, *Callissoma* for *Callisoma*, *Ipimedia* for *Iphimedia*, *Leuchothoë* for *Leucothoë*, *Cyrthophium* for *Cyrtophium*, *Lysita* for *Lusyta*. Some of these names are given in the right as well as in the wrong form, and of *Lysita* Nardo himself supplies the correction. The errors are noticed here as some safeguard against the repetition of them.

INDEX OF SPECIES.

NOTE.—Generic and specific names, when there is good reason to regard them as synonyms, are printed in italics ; of the specific names printed in plain letters many are of more or less doubtful validity, the descriptions hitherto given not sufficing for their accurate determination. With the earliest name of a species the name of the author who established it is printed in plain letters, italics being used for the authors of all subsequent names. Dark numerals indicate the page at which a description of a species or remarks upon it will be found.

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[1] "*Acanthonotus Cranchii*, White," is quoted by mistake as a synonym in the Brit. Mus. Catal. Amph. Crust., p. 127.

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[1] *Onisimus litoralis* (Boeck).
[2] In my own view *Allorchestes* is a synonym, but the point being to some extent controversial, I have printed the name as valid.
[3] On p. 460, line 5, for *Nilsonii* read *Nilssonii*.

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[1] On p. 314, line 34, for *Gaimardi* read *Gaimardii*.

[2] If Boeck be right in stating, De Skand. og Arkt. Amph., p. 57, that Stimpson's *Pseudopthalmus limicola* can scarcely be separated from *Ampelisca tenuicornis*, Liljeborg, the specific name *limicola* has the priority.

[3] This species makes a near approach to *Ampelisca carinata*, Bruzelius; on p. 1061, line 27, for upper antennæ, *read* lower antennæ.

[4] May not this be the same as *Amphilochus tenuimanus*, Boeck?

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[1] On page 49, line 32, for 1834 read 1835, and for *Edvardsii* read *Edvardsi*. with a full stop.

[2] In the Brit. Mus. Catal. Amph. Crust., p. 186, "*Amphitoë Fresnelli*, Audouin," is given as a synonym of "*Melita Fresnelli*," instead of "*Gammarus Fresnelii*, Audouin," Milne-Edwards having previously attributed his "*Amphithoe Fresnelii*" to Audouin.

[3] *Amphitoe Jurinii?* (Kroy.), is given by Bell and Westwood, probably by mistake so far as the authority cited is concerned, see pp. 281 and 1634.

[4] On p. 305, lines 41, 42, omit the words "both before and;" *Cancer Gammarus obtusatus*, Montagu, was transferred to the genus *Melita* by Spence Bate in 1862.

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[1] Boeck, De Skand. og Arkt. Amph., p. 510, says that Stimpson referred the species "*A. serratus*, O. Fabr," to *Amphithonotus*, but that is a mistake, see p. 278, and Boeck himself, *op. cit.*, p. 240.

[2] This is Bruzelius' *Paramphithoe tridentata*, which Boeck in 1870 transferred to *Halirages*.

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[1] *Anonyx brevipes*, Holbøll, is probably the same as "*An. bonæ spec.*," Holbøll, MS., 1842. See p. 200.

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[1] On p. 296, line 46, for *kα arthros* read *kallarthrus*.

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[1] This is *Ægina ? aculeata*, Dana, which Boeck named *Æginella aculeata*.
[2] See note on "*Caprella Penantis*," Leach.
[3] On p. 559, line 34, for "Caprella Dohrni," Heller, read "Caprella Dohrni," Haller.

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[1] On p. 95, lines 29, 30, for "ou en distinque," read "ón en distingue," and for "de" read "du."

[2] A catalogue name, Mittheil. Zool. Stat. Neapel 1881, Bd. 2 p. 526. See Mayer, Die Caprelliden, p. 51, where it is recognised as a synonym of *Caprella dentata*, Haller.

[3] As Mayer identifies this with *acutifrons*, Leach–Latreille, 1816, it would seem to take precedence of the latter name.

[4] This is *Ægina? tenella*, Dana, which Boeck named *Æginella tenella*.

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[1] The name *Dactylocera Nicetensis*, p. 190, line 16, had not been *previously* used, but is given by Milne-Edwards in a footnote as though it had been.

[2] This name is given in the Brit. Mus. Catal. Amph. Crust., p. 151, from "*Cat. Crust. Mus. Roy. Coll. Surgeons*, p. 94," as a synonym of "*Amphithonotus Edwardsii*."

[3] See *Pherusa fucicola*, Leach.

[4] This species should have been mentioned in the Note on Grube, p. 348.

[5] See Brit. Mus. Catal. Amph. Crust., p. 376. Boeck names the species *Halirages tridentatus*.

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[1] The suggestion, p. 97, that "*Typhis ovoides*, Risso," should be called *Dithyrus ovoides*, as well as the suggestion, p. 500, that *Platyscelus intermedius*, Thomson, should be called *Dithyrus intermedius*, is withdrawn for the reasons mentioned on pp. 1463, 1464.

[2] Boeck, De Skand. og. Arkt. Amph., p. 56, spells this name *Aegidia*.

[3] Since *Ephippiphora* is preoccupied, the suggestion made on p. 177 that it will take precedence of Boeck's *Socarnes* must be cancelled, and with it the name "*Ephippiphora vahlii*, Krøyer," falls to the ground.

[4] Bate and Westwood, Brit. Sess. Crust., vol. ii. p. 528, identify *Acanthonotus owenii*, Sp. Bate, and *Epimeria tricristata*, Costa, with *Epimeria cornigera* (Fabricius), therefore anticipating Boeck, who independently took the same view in 1870

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[1] On p. 566, line 29, and p. 583, line 30, for *Erysthræus* read *Erysthræus*, and on p. 583, line 30, for *erythrophthalmus* read *erythrophthalmus*.

[2] The three varieties of *Gammarus aheneus* should have been mentioned on p. 427. Dybowsky's own index omits var. *setosus*.

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[1] For this species Eichwald cites Pallas, "Reise durch Russland I. Petersb. 1801, p. 477."

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[1] Brit. Mus. Catal. Amph. Crust., p. 169, as synonym of "*Protomedeia fimbriata*."
[2] This is referred to as *Gammarus inequimanus*, Brit. Mus. Catal. Amph. Crust., p. 182.

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[1] Spence Bate in his Synopsis, 1857, gives "*G. Moggridgii* (mihi) Ann. Nat. Hist. 1851," as a synonym of *Gammarus Sabinii*, instead of *A. Moggridgei*.
[2] On p. 56, line 24, for accidently *read* accidentally.
[3] On p. 274, line 10, for *Gammarus orchestiipes* read *Ceradocus orchestiipes*.
[4] Milne-Edwards gives this species as *Peloponesicus* in the index to the Hist. Nat. des Crustacés.

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[1] On p. 1170, line 17, for *steenstrupii* read *steenstrupi*.

[2] On p. 314, line 13, for *bispinosa* read *bispinosus*.

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[1] This genus is provisional, see p. 564.

[2] On p. 365, line 16, for *nilsonii* read *nilssonii;* and on p. 460, line 6, for *Nilsonii* read *Nilssoni*.

[3] To this species Czerniavski adds two varieties, *brevicornis* and *pontica;* see under *Nicea*.

[4] If it should prove that *Hyalella andina* (Philippi) is identical with *Hyalella azteca* (de Saussure), de Saussure's specific name has the priority.

[5] According to Bovallius, Arctic and Antarctic Hyperids, p. 561, this is synonymous with his *Euthemisto nordenskiöldi*.

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[1] For the disentanglement, so far as practicable, of the synonymy of *Hyperia medusarum*, the papers by Bovallius and Hansen in 1887 should be consulted.

[2] Gosse's species, according to the Brit. Mus. Catal. Amph. Crust., pp. 292, 293, is *Hyperia galba*, Montagu.

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[1] On p. 284, line 18, for *auguipes* read *anguipes*.

[2] See note on *Microdeutopus versiculatus*, p. 1711.

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[1] See also Chevreux, Nouvelles espèces de Crustacés Amphipodes du sud-ouest de la Bretagne. Assoc. Franç. pour l'avancement des sciences, Congrès de Toulouse, 1887 (1880).

[2] On p. 496, line 25, for Sp. Bate, *read* Bate and Westwood.

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[1] The Brit. Mus. Catal. Amph. Crust., p. 229, gives this name to the "*Gammarus Kroyeri*" of Bell and Westwood, 1855, which Boeck identifies with *Melita dentata*, Krøyer, although the third uropods do not agree with the definition of *Melita*.

[2] Grube's paper, already noticed p. 388, is in the "Abhandlungen der Schlesischen Gesellschaft für vaterländische Cultur. Abtheilung für Naturwissenschaften und Medicin, 1868–69. Breslau 1869," pp. 91–129, Taf. 2. A list of Crustacea at p. 125 contains under *Megamoera* the entry "M. *subserrulata Sp. B.* ?," probably by a mistake for *Megamoera semiserrata*, Spence Bate.

[3] White in 1847 gives "*Melita obtusata*, Leach" as a synonym of *Amphithoe obtusata*.

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[1] A synonym of *Autonoe plumosa*, Boeck, according to the Museum Normanianum, 1886.
[2] *Autonoe longipes*, Bruzelius, 1859.
[3] *Gammarus macronyx*, Liljeborg=*Protomedeia fasciata*, Krøyer, 1842.
[4] This is named *Autonoe versiculata* in the Museum Normanianum, 1886, so that the priority of the genus *Lembos* over *Autonoe* comes in question.
[5] Boeck in 1870, but not in 1876, makes *Microdeutopus websterii*, Sp. Bate, a synonym of *Protomedeia fasciata*, Krøyer. It is named "*Autonoe Websteri*" in the Museum Normanianum, 1886, in regard to which the remark made in the preceding note will apply.
[6] On page 384, line 24, for *nubeculatas* read *nubeculatus*, and on page 371, line 11, for *nubitalus* read *nubilatus*.

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[1] Brit. Mus. Catal. Amph. Crust., p. 369, for *Leucothoe phyllonyx*, M. Sars, now called *Aceros phyllonyx*.

[2] The generic position of *Nicea lucasii*, Nicolet, is still ambiguous, nor is that of *Nicea egregia*, Chilton, quite free from doubt.

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[1] The name *Œdiceroides conspicua* mentioned on p. 547, lines 7, 8, was never established, see p. 850.

[2] Boeck subsequently referred this species to two distinct genera, as will be seen by comparing his Crust. amph. bor. et arct., pp. 84, 91, with his De Skand. og Arkt. Amph., pp. 267, 288.

[3] There is nothing to show whether Grimm's genus *Onesimus* is an independent but preoccupied name or a synonym of Boeck's *Onisimus*.

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[1] See Brit. Mus. Catal. Amph. Crust., p. 369.

[2] "*Orchestia Bonelliana*, White, Cat. Crust. B. M. 1847," is given as a synonym of "*Allorchestes Pereiri*" in the Brit. Mus. Catal. Amph. Crust., p. 42, 1862, but I cannot find any such name in White's Catalogue.

[3] This species is given as *Chilensis* in the index to Milne-Edwards' work, and that form has been adopted by Dana and Spence Bate.

[4] "*Orchestia constructa* (young?), Costa," is given by mistake for *Orchestia constricta*, as a synonym of "*Orchestia Mediterranea*" in the Brit. Mus. Catal. Amph. Crust., p. 24, 1862.

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[1] On p. 254, line 41, for *quadrimanus* read *quadrimana*.

[2] On p. 254, line 40, for *rectimanus* read *rectimana*.

[3] Adams and White, in the synonymy of *Rhabdosoma armatum*, give "*Oxycephalus armatus*, M.-Edw., Crust. III. p. 101. pl. 30. f. 10, copied. (Tab. XIII. Fig. 8.)," but their previous statements and the lettering of Tab. XIII. alike show that the words "pl. 30. f. 10, copied. (Tab. XIII. Fig. 8)" should have been referred to the independent species, *Oxycephalus piscator*, M.-Edw.

[4] On p. 353, lines 6, 7, for *Palæocrangon problematicus* read *Palæocrangon problematica*. The carboniferous *Palæocrangon* referred to by Claus, see p. 508, is perhaps a distinct genus from Schauroth's.

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[1] The species of *Paramphithoe* in plain letters need to be transferred to some other genus or genera; see the remarks on *Paramphithoe*, p. 314.
[2] See under *Pleustes*.
[3] On p. 1479, line 8, for *pacifica* read *pacificus*.

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[1] This is not Krøyer's *Amphithoe bicuspis*; that view, though accepted at p. 179, is corrected on p. 1635. Bate and Westwood give *Pherusa cirrus* as a synonym of their *Pherusa bicuspis*.

[2] Brit. Mus. Catal. Amph. Crust., p. 377, for *Paramphithoe elegans*, Bruzelius (see p. 314).

[3] The Brit. Mus. Catal. Amph. Crust. refers to White's Catalogue of 1850 by mistake for that of 1847.

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[1] The valid species under *Proto*, Leach, must be transferred to the older genus *Phtisica*, Slabber, and *Proto ventricosa* must yield priority to *Phtisica marina*. See Glossary, under Zee-Scherminkel.

[2] Museum Normanianum, 1886.

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[1] Heller's species *Podocerus largimanus* and *Podocerus longicornis*, ought probably to be referred either to the genus *Grubia*, Czerniavski, or to *Amphithoides*, Kossmann.

[2] Afterwards called *Dercothoe* (*Cerapus*) *punctatus*.

[3] On p. 24, line 43, for *Aquoticæ* read *Aquaticæ*.

[4] See footnote to *Œdiceros norvegicus*, Boeck, p. 1713.

[5] On p. 560, line 32, for *tergestina* read *tergestinum*.

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[1] *Echinimana* is a provisional name only.

[2] The species of *Proto* printed in plain letters belong to the genus *Phtisica*, Slabber.

[3] Spence Bate, Brit. Mus. Catal. Amph. Crust., p. 169, gives this name to "*Gammarus fimbriatus*, Stimpson, MS.," but he says of it, "I do not feel quite satisfied that this species is distinct from *P. pinguis*."

[4] *Limicolus*, in the index to Stimpson's work.

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[1] The figure which Westwood gives of "*Stegocephalus* (Kroy.) *ampulla* (Phipps)" has the postero-lateral angle of the third pleon-segment acute and a little upturned, but otherwise it closely agrees with Krøyer's *Stegocephalus inflatus*. Bell gives "*Stegocephalus Ampulla*, Kroy.," in the synonymy by mistake for *Stegocephalus inflatus*. In the definition of *Stegocephalus* (see p. 198) Krøyer says, "Pedes quinti paris pedibus tertii quartique paris structura et directione similes," a peculiarity at which he himself expresses his surprise, Naturh. Tidsskrift, ser. 2, Bd. i. p. 528, but Dana and Boeck are no doubt right in regarding the statement as an error.

[2] On p. 394, line 4, and p. 538, line 42, for *Christianensis* read *Christianiensis*.

[3] The statement that this species is the same as *Cancer ampulla*, Phipps, has lately been corrected by Hansen, see pp. 599, 729.

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[1] On p. 176, line 26, for *platychelis* read *platycheles*.

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[1] Boeck says that his "*Glauconome steenstrupi*" is probably only the female of "*Glauconome krøyeri.*"

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ADDENDA.—Since the earlier part of the Index was printed, E. Chevreux has described *Ampelisca sarsi*, n. sp., and *Ægina capillacea*, n. sp. For *Phædra kinahani*, Sp. Bate, in accordance with the suggestion of Boeck, 1876, he adopts the name *Lilljeborgia* [*Liljeborgia*] *kinahani*. His paper is entitled, "Nouvelles espèces de Crustacés Amphipodes du sud-ouest de la Bretagne. Association française pour l'avancement des sciences *Fusionnée avec* l'association scientifique de France, Congrès de Toulouse.—1887. Paris, 1888." Another paper by the same author is entitled "Contribution à l'étude de la distribution géographique des Amphipodes sur les côtes de France. Extrait du *Bulletin de la Société d'études scientifiques de Paris*, 11e année, 1er semestre 1888." No new species are described, unless it should prove that one which is named "? *Caprella spinosissima*" is in fact novel.

"Les Plages du Croisic, récoltes zoologiques par Adrien Dollfus avec la collaboration de MM. Ed. Chevreux et Ph. Dautzenberg, Paris, 1888," is another recent addition to the literature of the Amphipoda. No new species are described.

In a note dated Stazione Zoologica, Napoli, November 19, 1888, Dr. Mayer informs me that he has quite recently seen specimens of *Æginella spinosa*, Boeck. From the examination of these he is inclined to keep *Æginella* distinct from Krøyer's *Ægina*. Should this eventually be considered necessary, whatever new generic name may be substituted for the preoccupied *Ægina* will apply to the species *echinata*, Boeck, *longicornis*, Krøyer, and *spinosissima*, Mayer, while *aculeata*, Dana, *tenella*, Dana, and *tristanensis*, of this Report, will remain indeterminate as regards their generic position (see pp. 1248, 1686).

In re-examining the Challenger collection of Gammarina, I find that in a few instances some duplicate specimens have been omitted from the enumeration given in the text, and that one addition must be made to the series of specimens obtained from below 300 fathoms. For this last the following preliminary description may here suffice:—

Genus *Pardaliscoides*,[1] n. gen. Near to *Pardalisca*. Peduncle of the upper antennæ not very short. Palp of first maxillæ of moderate breadth. Outer plate of the maxillipeds narrow as well as short. The peræopods slender; the third joint in the first and second pairs moderately long, not dilated. Telson shorter than the peduncle of the third uropods, divided nearly to the base, dehiscent.

Pardaliscoides tenellus, n. sp. Rostrum acute. In the upper antennæ the second joint of the peduncle narrower but rather longer than the first, the third joint longer than broad; the secondary flagellum elongate, with eight joints remaining. Lower antennæ having the fourth joint of the peduncle longer than the fifth, and about equal in length to the nine-jointed flagellum. Mandibles, first maxillæ, and gnathopods having a general resemblance to those of *Pardalisca abyssi*, the second maxillæ to those of *Pardalisca marionis*, the peræopods and telson to the figures given by Bruzelius for *Nicippe tumida*. There are three spines in

[1] In the Introduction, p. xxii, it should have been stated that two specimens were obtained of *Elasmopus delaplata*, and two of *Podocerus hoeki*. To include these together with *Paradaliscoides tenellus*, the statistics should be that in the 34 specimens 26 genera are represented, of which 11 are new, and 29 species, of which 27 are new. On p. xxiv, line 4, for thirty-one read thirty-two, and line 28, for Prestandres read Prestandrea.

the spine-row of the left, two in that of the right, mandible. The palp of the first maxillæ is apically fringed with nine spine-teeth. The joint of the maxillipeds which carries the outer plate is not largely developed; the third joint of the palp is elongate as well as the second. The finger in the gnathopods carries very inconspicuous spinules. In the first and second peræopods the fourth joint is considerably longer than the third; the fifth joint in the second pair has a fringe of about a dozen short blunt spines, which are not seen on the first pair. The uropods of the specimen were damaged. The peduncle in the first pair is long; in the second pair the outer ramus is rather longer than the peduncle but much shorter than the inner ramus; in the third pair the rami are laminar, longer than the peduncle. There appears to be a small dorsal tooth on each of the hinder segments of the pleon. This species seems to stand between *Pardalisca* and *Nicippe*, as *Synopioides* between *Nicippe* and *Halice*. Length of specimen, without the antennæ, not quite a third of an inch. It was taken at Station 297, November 11, 1875; South Pacific; lat. 37° 29′ S., long. 83° 7′ W.; tow-net at the trawl; depth, 1775 fathoms; bottom temperature, 35°·5; surface temperature, 57°.

On p. 1690, to the species of *Anonyx* should be added on Krøyer's authority, *bonæ spei*, Holbøll, MS., 1842; *flagelliformis*, Holbøll, MS., 1846; *medius*, Holbøll, MS., 1846; *perfoliatus*, Holbøll, MS., 1846. The first three of these Krøyer identifies with Holbøll's *Anonyx Eschrichtii* under the name *Opis typica;* the fourth he unites with his own *Anonyx holbölli* (compare pp. 200, 215). The footnote on p. 1690 must be cancelled, since "*An. bonæ spec.*" in Krøyer's work was merely a misprint for *An. bonæ spei*, a species distinct from *Anonyx brevipes*.

GLOSSARY AND GENERAL INDEX.

NOTE.—Dark numerals indicate pages on which definitions or descriptions will be found.

Abdomen (perhaps for adipomen, from adeps, fat), sometimes used of the pleon, which Boeck calls the post-abdomen, considering that the last five segments of the peræon in the Amphipoda are homologous to the abdomen in the Insecta, 105, 184, 139, 553.

Adactyle (*à-*, without, *δάκτυλος*, finger), "Le mot *adactyle* signifie simplement que ces mains n'ont pas de doigts comme celles des crabes" (Latreille, Hist. Nat., tome vi. p. 298), 89, 104.

Addome = abdomen, 150, 152.

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Alimentary canal, **154, 482, 489, 504, 574.**

Amfipodi anomali, 297.

Amphipoda (*ἀμφί*, around, *πούς*, a foot, "pieds dirigés en tout sens," Latreille, Nouveau Dict., tome viii. p. 493, 1817. Agassiz, in his Nomenclator zoologicus, derives the word from *ἀμφί*, utrinque, and *πούς*, pes ; but since animals with feet seem universally to have them on both sides (utrinque), that derivation makes the word unmeaning. Bate and Westwood say that it is "derived from the Greek *ἀμφω*, both ; *ποδες*, feet," and that "this name was given by Latreille to the present order of Crustacea on account of the animals contained in it having both swimming and walking legs, and to distinguish it from the order Isopoda, in which the legs are adapted for walking only." Latreille's own explanation is, however, the most satisfactory, since it suits the form of the word as well as the facts of the case, for, without taking into account the pieds-nageoires, we find the gnathopods capable of very free movement, the first two pairs of peræopods commonly directed forwards, and the last three pairs directed in various positions upwards, backwards or downwards, and sometimes spread out to some extent sideways).

The Amphipoda are first mentioned in the Nouveau Dict. Hist. Nat., tome i. p. 467, 1816. The description Latreille there gives is as follows:—"Amphipodes, *Amphipoda*, Lat. Ordre de crustacés ayant pour caractères ; mandibules portant un palpe; yeux sessiles et immobiles ; tête distincte du tronc ; troisième et dernière paire de mâchoires en forme de lèvre, avec deux palpes ou deux petits pieds réunis à leur base. Leur corps est foiblement crustacé, le plus souvent comprimé et arqué. La tête est distincte, avec deux yeux et quatre antennes presque toujours sétacées. La bouche est formée d'un labre, de deux mandibules portant un palpe filiforme et saillant ou découvert, d'une languette, de deux paires de mâchoires, avec deux pieds-mâchoires, au dessous, et recouvrant les organes précédens, tantôt dilatés au coté interne, tantôt réunis à leur base ; ils représentent une lèvre inférieure avec deux palpes. Le tronc est divisé en sept anneaux, portant chacun une paire de pieds, dont les quatre premiers dirigés en avant, sont souvent terminés par une serre, avec un seul doigt, ou en griffe. A la base intérieure de chaque pied, en commençant à la seconde paire, est un corps ovale et vésiculeux, qui me paroît être une branchie. La poitrine offre en outre, dans les femelles de petites lames ciliées sur leurs bords, destinées à recouvrir leurs œufs. Le coeur s'étend dans la longueur du tronc, comme dans les stomapodes, et ressemble à un vaisseau dorsal, mais ayant des rameaux. Le tronc se termine par une queue de six à sept articles, ayant en dessous cinq paires de pieds-nageoires sous la forme de filets, et divisées en deux branches articulées ; ils sont très-mobiles, analogues aux pieds branchiaux des stomapodes, et servent peut-être aux mêmes fonctions ; l'extrémité de cette queue est courbée en dessous, et le dernier anneau est ordinairement terminé par de petits appendices en forme de styles articulés, épineux, et rarement par de petites lames en feuillets. Les amphipodes nagent et sautent avec agilité, et toujours posés sur le côté. Les uns habitent les ruisseaux et les fontaines, les autres les eaux salées. Leur accouplement ressemble à celui des insectes, le mâle étant placé sur le dos de sa femelle ; l'union dure quelque temps, et la femelle emporte souvent le mâle, qui est alors sous son ventre. Les œufs sont rassemblés sur la poitrine et recouverts par les petites écailles dont nous avons parlé, ce qui leur forme une sorte de poche ; ils s'y développent ; les petits restent attachés aux pieds ou à d'autres parties du corps de leur mère, jusqu'à ce qu'ils aient acquis assez de vigueur pour n'avoir plus besoin de ce secours." There have been numerous subsequent definitions, some of which will be found under the references, 95, 99, 122, 137, 139, 144, **170, 175, 184,** 206, 208, 215, 222, **256, 259, 282,** 289, 316, 365, **480, 508, 547,** 553, **579,** 601, **1655.**

Anfipodi, 205.
Anfipodos, 231.
Anisopoda, 256, **260**, 289, **554**.
Annulosa, a subkingdom in zoology comprising the Arthropoda and Anarthropoda, in which the body is more or less evidently composed of a succession of *annuli* or rings, 91, 478.
Annulus, a body-ring, segment, or somite, 153, 264.
Anostéozoaires (ἀ-, without, ὀστέον, bone, ζῶον, animal), **94**.
Anostia (ἀ-, without, ὀστέον, bone), **88**.
Antennæ (antenna, in Latin, a sailyard), in a Crustacean the appendages of the (theoretical) second and third segments. The two pairs are distinguished by different writers as respectively first and second, 473; upper and lower, 84, 122, 245; anterior and posterior, 487, 536; posterior and anterior, 64, 149; inner and outer, 78, 515; antennules and antennæ, 463, 1215; auditory and olfactory (Spence Bate, Brit. Assoc. Rep. for 1875); Milne-Edwards, **154**; Spence Bate, 280, **473**; Bruzelius, **313**; Fritz Müller, **349**; Leydig, 349, 480; Claus, 487, 597.
Antennæform processes, palps of the mandibles, 102.
Antennary gland, 505, **510**, 553.
Antennules, see Antennæ. This diminutive is not well suited to the Amphipoda, seeing that in many species of this group the upper antennæ exceed the lower in size.
Antennules, applied to parts of the mandibles, maxillæ, and maxillipeds, 57.
Antens = Antennæ, 99.
Anterior. By a conventional use, this word is applied to that edge of the leg which, when the limb is extended downwards, is turned towards the head; thus in the gnathopods and first two pairs of peræopods what would naturally be regarded as the back of the hand is called the anterior or front margin, while the clasping edge is called the posterior or hind margin.
Antliata (ἀντλέω, I drain, in reference to the *haustellum* or sucking apparatus), 41, **65**.
Aorta (ἀορτή, from ἀείρω, I raise), **338**, **372**, 476, **489**, **505**, **526**.
Apiropodes (ἄπειρος, without limit, πόδες, feet), **92**.
Apodeme (ἀποδέω, I bind fast), 463.
Appendages, appendices, 153, 463, 563; correlation of, 474; renewal of, 474.
Appendiculata, 478.
Appendix caudalis, the telson, 178.
Aptera (ἄπτερος, unwinged), 11, **14**, **15**, 18, 20, 26, 36, 42, 52, 53, 55, 58, 62, 65, 69, 86.
Arteries (ἀρτηρία, originally supposed to be an air-duct, the derivation suggested for the word being ἀήρ, air, τηρέω, I preserve), 338, 476, 487, **505**, 526, 527, 549, 598.
Arthrocephalés (ἄρθρον, a joint, κεφαλή, head), **78**.
Arthropoda (ἄρθρον, a joint, πούς, foot). The Encycl. Brit., vol. ii. 1875, explains that the Class is named from the articulations of the limbs, and also says, "Leach, and later (1825) Latreille, proposed *Condylopoda* as the name of the group for which Arthropoda was afterwards devised. Custom has overborne the rule of priority, and the latter is now the more common name." Latreille, however, employed the term Condylipoda in 1802, and must therefore have preceded Leach, 477, 479, **552**.
Arthrostraca[1] (ἄρθρον, a joint, ὄστρακον, shell), proposed by Burmeister in place of the older term Edriophthalma or sessile-eyed. Sars, Hist. Nat. Crust. d'eau douce de Norvège, explains that it refers to the regularly segmented body and the considerable development of the dorsal arch of each segment which seems to represent a sort of separate carapace, of which the lateral portions are often very prominent, covering more or less distinctly the base of the corresponding limbs. As the second order of the Malacostraca, in the classification adopted by Sars, it includes the Amphipoda and Isopoda, the first order, the Thoracostraca, embracing the Decapoda, Stomatopoda, and Cumacea, **169**, 477, 508, **552**, 601, **1655**.
Articulata, "the name given by Cuvier to his third great division of the Animal kingdom. Arthropoda is the designation now generally adopted, which includes the *Crustacea*, *Arachnida*, *Myriapoda*, and *Insecta*, but excludes the *Annelida*, which Cuvier classed with these among the Articulata" (Encycl. Brit., vol. ii. 1875), 101.
Articulation, used by Bate and Westwood, Brit. Sess. Crust., vol. i. p. 6, to express the connecting hinge, as distinguished from *joint*, used for a portion of a limb.
Astacoides, Astacoidea, 78, 87.
Auditory apparatus, 290, 325, 449, 474, 504.
Bacilli, hyaline, 457.
Baguettes olfactives, olfactory rods or filaments, 595.
Basipodite (Milne-Edwards, according to Wrześniowski, 1881), or basopodite, 290 (βάσις, a stepping, πούς, foot), shortened into basis, 290, basos (Bate and Westwood), or basus, the second (first free) joint of the Amphipod leg. The equivalents in different authors are—first joint (used in this Report); second joint; hanche, 140, 155; trochanter supérieur; femur, 34, 37; thigh; second coxal-plate; Hüfte, 485; arm, 536; Oberarm; Schenkel, 1607; tibia, 149.
Bastoncelli, little rods, 1652.
Bâtonnets hyalins, olfactory filaments, 548; cylindres à bâtonnets, 515.
Biliary vessels. See Liver.
Bismarck-brown, strongly recommended for the colouring of living organisms. See Mayer, Die Caprelliden, pp. 153, 160.
Blastoderm (βλαστός, germen, embryo, δέρμα, skin), 464, 531, 553.
Blastomere (βλαστός, and μέρος, a part), 463.
Brain, 133, 349, **364**, 489, **567**, 1646.
Branchiæ (βράγχια, in Latin branchiæ, the gills of fishes). Latreille, 95; Milne-Edwards, **154**, **184**, 185; Krøyer, 202; Frey and Leuckart, 219; Nicolet, 232; Dana, 260, 264; Williams, 280; Costa, 296; Valette, 304; Boeck, 324; Lilljeborg, 361; Grube, 366; Hesse, 419; Dezsò, 476; Wrześniowski, 501, 507; Smith, 522; Claus, 598.
Branchiæ, number of, in *Phronima*, Milne-Edwards, 185; Giles, 1642.

[1] Page 552, line 36, for *Arthrocostraca* read *Arthrostraca*.

Branchiogastra (βράγχια, breathing-organs, γαστήρ, abdomen), **72**, 73, 74, **79**.
Branchypia, 88.
Brangasteria (βράγχια, γαστήρ), 87.
Bras, 155. See Meropodite.
Cabeza, 232. See Cephalon.
Cæca, 304, 438, 489, 504, 519, 574.
Calceolus (in Latin, a small shoe), a name suggested by Stimpson (in the form *calceola*) for certain appendages of the antennæ, variously explained as olfactory, auditory, or prehensile; Milne-Edwards, **141**; Guérin, 148; Krøyer, 177, 200; Valette, 304; Leydig, 349, 481; Marcusen, 369; Bos, 423; Hoek, 496; Dybowsky and Wrześniowski, 504; Blanc, 543, **548**; Barrois, 587.
Capités, 78.
Capture of specimens, 197, 484, 600, 1655.
Carcinology (καρκίνος, a crab, λόγος, discussion), the natural history of Crustaceans, 495.
Cardiac (καρδιακός, belonging to the heart, καρδία); from analogy with vertebrates, the anterior part of the stomach in Amphipoda is called cardiac, without reference to the actual position of the heart, 482.
Cardio-aortic[1] valves; arterial ostia; these connect the heart with the upper and the lower aorta, opening at the systole to admit the passage of the blood, and closing at the diastole to prevent its flowing back from the aortas, 505, 526.
Cardio-pericardiac openings; venous ostia; the oblique lateral orifices of the heart, which admit the blood into it from the pericardium, when the heart dilates at the diastole; during the systole they are closed. Normally they occur in pairs in the second, third, and fourth peræon-segments; in *Corophium* only in the fourth segment, 505, 527.
Carpopodite (καρπός, wrist, πούς, foot), the fifth (fourth free) joint of the leg, 290. The equivalents in different authors are—fifth joint; fourth joint, 291; wrist; jambe, 93; carpe, 155; genou; Handwurzel, 532; Afterhandwurzel, 532; Fusswurzel, 532; carpus, 290, 291; pseudocarpus, 532; tarsus, 532; metatarsus, 149, 532.
Caudal stylets. See Uropods.
Cement glands, 432, 496, 522, 1651.
Cephalization, 264.
Cephalon (κεφαλή, head), head, tête, Kopf, Kopfsegment, cabeza, caput, cephalothorax, 259; the front portion of an Amphipod, comprising (theoretically) seven coalesced segments, of which the first six are properly cephalic, the seventh being homologous with the first of the three thoracic segments in the Insecta, **264**, **289**, **463**.
Cephalostegite (κεφαλή, head, στέγω, I cover), 463.
Cerebral ganglion. See Brain.
Chelate (χηλή, a claw), cheliferous, 27, 44; cheliform, 29, 54, 88, 179, 588; with a didactyle hand, 97, 143, 1622; Scheere, 597; properly used of a limb in which a movable joint closes almost throughout its whole length against the lateral margin of another joint, but in early writers often equivalent to subchelate.
Chiasma, a crosswise position, like the strokes of the Greek letter χ, 1646, 1652.
Chitin, Chitine (χιτών, a coat). Huxley, The Crayfish, p. 347, in regard to the exoskeleton of the crayfish, says:—"The animal matter consists for the most part of a peculiar substance termed *Chitin*, which enters into the composition of the hard parts not only of the *Arthropoda* in general, but of many other invertebrated animals. Chitin is not dissolved even by hot caustic alkalies, whence the use of solutions of caustic potash and soda in cleansing the skeletons of crayfishes. It is soluble in cold concentrated hydrochloric acid without change, and may be precipitated from its solution by the addition of water. Chitin contains nitrogen, and according to the latest investigations (Ledderhose, 'Ueber Chitin und seine Spaltungs-produkte:' Zeitschrift für Physiologische Chemie, II. 1879), its composition is represented by the formula $C_{15}H_{26}N_2O_{10}$." (See also Milne-Edwards, Hist. nat. des Crust., t. i. p. 10, and Darwin, The Lepadidæ, p. 30). 134, 279.
Chorion (χόριον, skin, leather), 320.
Choristopoda ("From χωριστός, separate, and πούς, foot, alluding to the fact that the pairs of feet belong each to a distinct segment of the body"), 215, **256**, **259**, 289, 601.
Chromatophore (χρῶμα, colour, φέρω, I bear), 477, 548.
Cilia, ciliæ (cilium, in Latin an eyelash), variously applied to delicate hairs and slender hair-like appendages. The term seems inappropriate for the "auditory cilia" of Bate and Westwood, see pp. 290, 504, which, as those authors themselves remark, are quite distinct from the "auditory cilia" of Hensen.
Circulation of the blood, Zenker, 148; Milne-Edwards, 153; Templeton, 169; Wiegmann, 182; Goodsir, 195; Frey and Leuckart, 219; Williams, 280; Leydig, 300, 482; Claparède, **343**; Dohrn, 364; Sars, 372; Parfitt, 422; Claus, 338, 476, **489**, 598; Wrześniowski, **505**; Delage, **525**; Mayer, 535.
Classification, Lamarck, 66, 105; Latreille, 71, 79, 81, 95, 99, 125, 136; Duméril, 78; Leach, 83, 85, 89, 91, 107; Rafinesque, 87, 88, 110; Tilesius, 87; Savigny, 92; Blainville, 94; Risso, 96; Desmarest, 122; Zenker, 135, 149; Milne-Edwards, 140, 153, 155, 184; Burmeister, 169; White, 222, 242; Dana, 254, 256, 259, 264; Gosse, 282; Bate and Westwood, 289, 290, 328, 332; Costa, 296; Bruzelius, 312; Gervais and Beneden, 316; Boeck, 321, 393, 410; Lilljeborg, 360; Czerniavski, 375; Buchholz, 423; Schiødte, 449; Stalio, 468; Gegenbaur, 477; Hayek, 479; Claus, 487, 490, 508, 552; Nicholson, 521; Woodward, 547; Kingsley, 554; Carus, 559; Sars, 567; Bovallius, 576; Gerstaecker, 579; Rolleston and Jackson, 1655.
Clavate (clava, a club), club-shaped, thickening gradually towards the distal end.
Clypeus (Latin clipeus, or clypeus, a round shield), 102, 103. See Epistome.
Colouring. Mr. Murray informs me that nearly all the Amphipoda taken in the dredge and trawl from deep water were of a red or rose colour, the eyes being frequently golden coloured. 221, 319, 382, 416, 430, 437, 438, 468, 578, 600, 1627, 1629.

[1] On p. 526, line 30, reference is made to an expression used by Delage, "une valvule cardio-péricardique antérieure," in which the epithet "cardio-aortique" would seem to be the one intended.

Commensal, one that feeds with, not like a parasite at the expense of, another, 392, 579.

Commissures (commissura, a connection, a band), the longitudinal fibres connecting the various ganglia. In *Gammarus neglectus* Sars describes a cerebral ganglion, seven thoracic and four abdominal ganglia, with a pair of separate commissures between each and its successor. The last three are considerably longer than those in front. From all of them nerves are given off as well as from the ganglia. In their structure Sars distinguishes an outer membrane and an inner granular content, composed of numerous ganglionic cells. In the Caprellidæ the abdominal commissures are naturally reduced to the vanishing point. 133, 489, 1646.

Complexly chelate or subchelate. "By this term [complexly] I mean, whenever the chelate character depends upon other joints than the propodos" (Brit. Mus. Catal. Amph. Crust., p. 262). For the German equivalents, see p. 597.

Condylipoda, condylipodes, condylopa, condylopes, condylopoda (κόνδυλος, knuckle or knob of a joint, πούς, a foot), "pattes noueuses," 72, 125.

Condylopia, 88.

Connective-tissue. "Immediately beneath the epithelial layer follows a tissue, disposed in bands or sheets, which extend to the subjacent parts, invest them, and connect one with another. Hence this is called *connective tissue*" (Huxley, The Crayfish, p. 178). Mayer describes it as a thin layer, not continuous but with lacunæ, under the whole epidermis in the head and body, present also in the antennæ and legs, except at their extreme points, throwing out attachments to the liver and stomach and heart, dividing the body into dorsal and ventral compartments, sheathing the ganglionic chain, and by its strong development in the branchiæ assisting in the purification of the blood, which is thus the longer exposed to the influence of the surrounding water. (Die Caprelliden, p. 130).

Coxopodite (coxa, the hip, πούς, a foot); the equivalents are first joint, side-plate, hanche, Basalglied, Hüftglied, Seitenplatte, erstes Coxalplatte, Coxa, Femur, Epimeron, Epimerum. It is a disputed question whether we have at the base of the Amphipod leg a lateral plate which is an outgrowth of the body-ring, carrying the more or less obsolescent first joint of the leg soldered to it, or whether the side-plate is itself a protective expansion of the first joint. 149, 289, 290, 365.

Crochet, 48, 140. See dactylopodite.

Crustacea (crusta, the hard surface of a body, the rind or shell, "Aquatilium tegumenta plura sunt. Alia . . . integuntur . . . crustis, ut locustæ," Plin. ix, 14), 6, 17, 52, 62, 66, 71, **78**, **79**, 125, **155**, 169, **479**, 552, **1655**. See also Encycl. Brit., vol. vi. p. 333, 1878 (H. Woodward).

Crustaceology, a hybrid word used by Leach to include the natural history of Crustacea and Arachnides, 83.

Crustata. The word *Crustata* applied to animals appears first to occur in Pliny, xi, 62, "Et cochleæ dentes habent: indicio est etiam a minimis earum derosa vitis. At in marinis crustata et cartilaginea primores habere, item echinis quinos esse, unde intelligi potuerit, miror." In Facciolati's Lexicon, the quotation, "in marinis crustata et cartilaginea primores dentes habent," makes Pliny assert the very thing of which he expresses himself as doubtful. Facciolati gives as an explanation of the word crustata, "h.e. pisces crusta, seu testa obducti." Jonston, De Exanguibus aquaticis, Lib. ii. c. 1, says, "Quae Crustata Plinio, illa Latinis aliis Crustacea, quod molli crusta operta sint, Graecis μαλακόστρακα, eandem ob causam dicuntur. Medium inter Testacea et Mollusca sortita locum videntur. Nam quatenus foris crusta, etsi fragili et tenui obteguntur, cum testaceis conveniunt: quatenus molle carnosumque intus continent, mollibus comparantur." 2, 4, 193.

Cryptobranches (κρύπτω, I conceal, βράγχια, breathing-organs), **96**.

Crystalline cones, Krystalkegel, cristallin, **154**, 462, 481, **490**, **495**, **1638**, **1652**.

Crystallites, Cristallites, little plates, concentrically striped and radiated, found between the epithelium and cuticle in *Caprella* and some of the Gammaridæ. In diluted acetic acid they disappear with a lively evolution of gas. The markings can sometimes be subsequently traced in the cuticle (Hoek, Carcin., p. 98, 1879).

Cuisse. See Meropodite, 93, 140, 155.

Cupule membraneuse, 141, 543. See Calceolus.

Cuticle (cuticula, skin, diminutive of cutis); the outer layer of the integument, lining both the body externally, and internally the alimentary canal, with the exception of the midgut (Bruzelius, Mayer, Spencer), 574. According to Huxley, The Crayfish, pp. 33, 196, the exoskeleton or cuticle is "produced by the cells which underlie it, either by the exudation of a chitinous substance, which subsequently hardens, from them; or, as is more probable, by the chemical metamorphosis of a superficial zone of the bodies of the cells into chitin." It is this exoskeleton, and not the epidermis or true skin which secretes it, that is thrown off in the process of exuviation.

Cylinders, 480, 626. In the descriptive part of this Report the expression filamentary cylinders has been frequently used for the Riechzapfen or olfactory tubes, as they are generally supposed to be: but the single word filaments has been adopted in the later descriptions, since Leydig has applied the name cylinder to a different kind of appendage.

Cystibranches, Cystibranchia (κύστις, a bladder, βράγχια, breathing-organs), 95, 96, 99, 135.

Dactia (δάκνω, I bite), **282**.

Dactylopodite (δάκτυλος, a finger or toe, πούς, a foot), seventh (sixth free) joint of the Amphipod leg; the equivalents are—sixth joint, seventh joint, claw, finger, nail, crochet, doigt, griffe, tarse, Klaue, Endklaue, dactylos, dactylus, unguis, 140, 149, 155, 290, 532.

Dactyloptera (δάκτυλος, finger, πτερόν, a wing), "this name is suggested for the two little wing-like plates on each pair of gnathopoda" (Spence Bate on *Phronima sedentaria*, Brit. Mus. Catal. Amph. Crust., p. 317), 1341.

Darmcanal, 489, 562, 598. See Alimentary Canal and Intestine.

Deutognathes (δεύτερος, second, γνάθος, jaw), Milne-Edwards gives this name to the first maxillæ, as following the mandibles which he calls protognathes.

Development, Milne-Edwards, 154, 160; Rathke, 171, 182; Leydig, 225, 482; Meissner, 287; Spence Bate, 290, 327; Valette, 320; Fritz Müller, 350; Bessels, 387; Beneden, 391; Beneden and Bessels, 392; Dohrn, 403; Packard, 448; Huxley, 463; W. Thomson, 472; Uljanin, 525, 531; Faxon, 533; Claus, 339, 553, 598; this Report, 1214, 1602.

Diastole (διαστολή, a drawing asunder, dilatation), 505, 507.

Didactyle, vaguely used by the older authors for hands that were either chelate or subchelate, but from its contrast to monodactyle, the correct use was probably for the former; 86, 97.

Dimorphism of males, 349, 408, 554, 562, 1024.

Dimorphism, sexual, 596, 1649.

Distribution, Krøyer, 180, 197; Eichwald, 193; Dana, 264; Lindström, 287; Heller, 359; Lilljeborg, 360; Bate, 363; Brady, 375; Edward, 381; v. Martens, 384, 566; Norman, 386, 458, 584; Boeck, 410; Möbius, 421; Smith, 434, 557; Metzger, 445, 446; Miers, 467, 555; Forel, 476; Fries, 494; Joseph, 496; Wrześniowski, 501, 1655; Haswell, 514; Markham, 517; Stuxberg, 523; Mayer, 535; Blanc, 548; Chilton, 551; Schmarda, Forsstrand, 577; Gerstaecker, 578; Koelbel, 584; Perrier, 585; Bovallius, 592; Chevreux, 596; Ross, 1620; Örsted, 1621; Whymper, 1648; Barrois, 1649.

Dolabriform (dolabra, a mattock or pick-axe), 103.

Domicola (domus, a house, colo, I inhabit), a term applied by Bate and Westwood to a group formed by the two families Corophiidæ and Cheluridæ, but in fact of more extensive application; 290, 328, 375, 483, 522, 527, 529, 542, 564, 578.

Drehgelenk (trochlea, turning-joint), 485. See Ischiopodite.

Dünndarm, 489.

Ecdysis (ἔκδυσις, a getting out; ἐκδύω, I strip off). See Exuviation.

Edrioftalmi, 205.

Edriophtalmes, 174, 417, 1647.

Edriophthalma (ἕδραῖος, sitting, sessile, ὀφθαλμός, an eye), Leach, 1815; a term evidently based on the word "sessiliocles" introduced by Lamarck in 1801; **89**, 122, 157, 166, 169, 242, 246, 281, **282**, 289, 295, 304, 601.

Edriophthalmaria. Gerstfeldt, 1858, adopts this form, giving the reference "Legio *Edriophthalmaria* M. Edw. (Ann. d. sc. nat. 3ème sér., 1852, XVIII. 120, 121)." He also observes that Dana's *Edriophthalmia* embrace not only the *Choristopoda*, that is the *Edriophthalma* of most other authors, but also the Trilobita, Entomostraca, and Rotifera, giving a reference to "Unit. Stat. expl. exped. Crust. I, 10."

Edriophthalmata, 222, 375, 521.

Edriophthalmes, 136, 155, **184**, 316.

Edriophthalmia, 215, 259, 264, 463, 468, 528, 547, 554.

Edriottalmi, 389, 390, 468.

Eleutherognatha (ἐλεύθερος, free, γνάθος, a jaw), **449**.

Endophragmal arch (ἔνδον, within, φράγμα, a fence), 299, **463**, 485.

Endopodite (ἔνδον, within, πούς, a foot), 1655; in the Crustacea the typical appendage attached to each side of a segment is considered to be composed of a basal piece, the protopodite, bearing a podobranchia, an endopodite and an exopodite, the endopodite, attached to the inner side of the extremity of the protopodite, the exopodite to the outer side. In the seven-jointed limbs of the Amphipoda, the first joint coalescent with the side-plate and the first free joint constitute the protopodite, the remaining five joints being the endopodite. To some of these appendages in the female a marsupial plate is attached, which possibly represents the exopodite. Some of them also in both sexes carry a branchial vesicle. In the upper antenna the protopodite by way of exception exhibits three joints, the so-called primary flagellum being in all probability the endopodite, while the secondary flagellum when present would seem to be the exopodite, although it is found on the inner side of the appendage. The bifurcation of the limbs is readily observable in the appendages of the pleon. See Huxley, The Crayfish, pp. 145, 173. See Tige, 153.

Enoplopodes, Hesse, 1873 ("De ἔνοπλος, armé; πούς, ποδός, pied"), 417.

Enteron (ἔντερον, a paunch), 477.

Entomeiline, 134.

Entomozoaires (ἔντομα, insects, ζῶα, living creatures), 94.

Enzyme (ζύμη, leaven), 489, 525.

Epimera (ἐπί, over, μηρός, thigh), 185, 202, 289, 452, 485, 597, 598. See Coxopodite.

Epipharynx (ἐπί, over, φάρυγξ, throat), the palate or upper part of the throat that succeeds the mouth-opening, 450.

Epistome (ἐπί, over, στόμα, the mouth). In the Amphipoda it is generally placed vertically, sometimes forming a ridge or produced to a sharp point. It sends up a narrow prolongation between the lower and upper antennæ to the rostrum. Below it widens, and forms the clypeus, in which the labrum is attached. Its inner surface gives attachment to the flexor muscles of the mandibles (Boeck). 289.

Epithelium (ἐπί, over, θηλή, a nipple); "Under the general name of *epithelium*, may be included a form of tissue, which everywhere underlies the exoskeleton (where it corresponds with the epidermis of the higher animals), and the cuticular lining of the alimentary canal, extending thence into the hepatic cæca. It is further met with in the generative organs, and in the green gland. Where it forms the subcuticular layer of the integument and of the alimentary canal, it is found to consist of a protoplasmic substance, in which close-set nuclei are imbedded. If a number of blood-corpuscles could be supposed to be closely aggregated together into a continuous sheet, they would give rise to such a structure as this; and there can be no doubt that it really is an aggregate of nucleated cells, though the limits between the individual cells are rarely visible in the fresh state. In the liver, however, the cells grow, and become detached from one another in the wider and lower parts of the cæca, and their essential nature is thus obvious" (Huxley, The Crayfish, pp. 177, 178). Bruzelius in describing the inner structure of an Amphipod gives a similar account. In *Amphithoë podoceroides* he notes as a peculiarity that the epithelial liver-cells, which are hexagonal, contain *two* nuclei

furnished with nucleoli. The hexagonal epithelial cells from various parts are figured by Claus, Der Org. der Phronimiden, 1879. In some Amphipoda these cells are very clearly visible in the pellucid skin. 464, 489, 562.

Epizoaires (*ἐπί*, upon, *ζῶα*, living creatures), 94.

Erioftalmi, 145, 152.

Euryhaline (*εὐρύς*, wide, *ἅλς*, salt), 421.

Eurytherm (*εὐρύς*, wide, *θέρμη*, heat), 421.

Exappendiculate, applied to the upper antennæ when without a secondary flagellum.

Exochnata (*ἔξω*, without, and *γνάθος*, a jaw), **64**. Latreille, Hist. Nat., t. v. p. 151, says "the Kleistagnatha have the palps broad and short, while the Exochnata have them narrow, elongated, in form of arms or true palps. The former have more resemblance to maxillæ. Fabricius in applying two denominations to like objects, of slightly different form, has been able to establish two Orders, but the distinction is little tenable, not being founded in nature."

Exopodite (*ἔξω*, without, *πούς*, a foot). See Endopodite.

Exuviation (exuviæ, what is stripped from the body, a cast skin), also called Ecdysis, the periodical process of casting the skin, which is essential to growth in the Amphipoda as in other Crustacea, 67, 153, **195**, 290, 333, 474. See Cuticle, and compare also Brit. Sess. Crust., vol. i. p. xxv.

Eyes, 139, 154, 201, 260, 270, 327, 372, 383, 386, 423, 449, 461, 471, 474, 475, 480, 481, 486, 490, 495, 509, 553, 559, 597, 1638, 1651.

Facetted, an expression applied to the transparent cuticle or cornea over a compound eye, when the cornea is divided, by a slight modification of its substance along the dividing lines, into square or hexagonal spaces. The cornea in the Amphipoda is said as a rule to be externally smooth, not facetted, 154, 260, 471, 474, 480, 481, 516, 597, 1638.

Fangorgane, grasping instruments, 274, 477.

Fausses pattes, or pates, 95, 139, 186, 189. See Pleopods and Uropods.

Femur (in Latin, the thigh), 34, 49, 149. See Coxopodite and Basipodite.

Ferment-cells. In the epithelium of the liver-tubes in the Gammaridæ Max Weber distinguishes ferment-cells and liver-cells. The former have in their plasma a pellucid secretion in form of a large vesicle. The liver-cells are full of little drops of secretion which are not affected by water, though they are by ether. In the opinion of P. Mayer, from whom these statements are taken, one and the same cell in its passage in the liver-tube from behind forwards probably performs different functions, at one time secreting fat-drops, then differentiating itself to a ferment-cell, after this being dispersed, or, on being pressed further forwards, resuming the production of fat (Die Caprelliden, pp. 150–156). 489.

Fibres musculaires, 1647.

Filament (filum, a thread), a term sometimes applied to the antennary flagellum, sometimes to the so-called olfactory tubes or cylinders.

Flagellum, also called terminal filament, fouet, funiculus, lash, seta, Geissel ; in the Amphipoda generally used only of the more or less whiplike series of joints attached to the peduncle in the upper and lower antennæ. The shorter lash (? the exopodite) often found on the *inner* side of the upper antennæ is known as accessory seta, 105, secondary or accessory flagellum, secondary appendage, Nebengeissel, flagellum appendiculare. For a more extended use of the word flagellum, see p. 153.

Flohkrebse, 170, 480.

Foot-jaws. See Maxillipeds.

Frontal organ, 477.

Gammarus (*κάμμαρος*, *κάμαρος*, *κάμμυρος*, cammarus, gammarus, a kind of crab, lobster or shrimp, according to Martial turning red when cooked), 5, 12, 40, 53, 1620.

Gancetto, a subchelate hand, 1622.

Ganglion (*γάγγλιον*, a tumour under the skin), a collection of nerve-cells from which nerve-fibres are given off. For the Caprellidæ Mayer distinguishes a hind-brain with the ganglionic knots in connection with it, namely, the optic ganglion and the ganglia for the two pairs of antennæ ; the subœsophageal ganglion consisting of several coalesced ganglia ; the supra-œsophageal ganglion connected with the frontal organ ; and a small unpaired ganglion lying medio-dorsally, from which runs an unpaired nerve, probably to the constrictores pharyngis. The ganglion of the first peræon-segment is in most genera in contact with the subœsophageal ganglion, in *Proto* actually coalesced with it. Each peræon-segment, from the second to the sixth, is provided with a ganglion ; for the seventh segment and the rudimentary abdomen there is a ganglion-complex, bearing traces of the same arrangement as prevails in the Gammaridæ. In *Gammarus neglectus* G. O. Sars describes fourteen ganglia, of which the three first belong to the head, the following seven to the seven segments of the peræon, and the succeeding four to the pleon, three corresponding to the three first pleon-segments, and the fourth and largest to the three remaining segments, being itself probably compounded of three originally distinct ganglia. The first or cerebral ganglion is much larger than the rest. It has an upper and a lower division. The lower, almost on a level with the rest of the ganglionic chain, and situated at the lower corner of the head, ends in four large conical processes which supply nerves to the antennæ. The upper division, placed vertically, much larger than the lower, and of rounded square form, has above two obtusely rounded lobes, separated by a median groove. Each of these shoots forward a fine nerve, which ends in a little ganglionic swelling at the root of the rudimentary rostrum. From the hinder outer part of each lobe runs the optic nerve. On the border of the two divisions of the central ganglion are a pair of little rounded lateral lobes. Two ganglia in close contact, separated from the cerebral ganglion by the œsophageal commissures, supply nerves to the mouth-organs. For the Phronimidæ Claus states that the subœsophageal ganglion mass is derived from the coalescence of six or seven ganglia, those of the two first peræon-segments being included in the complexus. The five following segments have each a ganglion, but that of the seventh segment lies immediately under its predecessor in the sixth segment instead of its own.

The three first abdominal segments have each a ganglion. Close upon the last follows the little last ganglion corresponding to three reduced and coalesced ganglia. The ganglion having a constituent from each side of the body is sometimes spoken of as the ganglion-pair or double-ganglion. 132, 219, 260, 304, 364, 438, 471, 489, 567, 597, 1646.

Garnell, 6, 7.

Gasteruri (*γαστήρ*, abdomen, *οὐρά*, tail), 83, 85.

Gattung, 120.

Genealogy, 134, 406, 423, 455, 479, 482, 526, 537.

Genera, rejection of, 140, 144, 187, 229, 256, 270, 356, 516, 568, 582.

Genou (genu, a knee). See Carpopodite.

Genu. See Ischiopodite.

Geschlecht, 120.

Gibbous (Latin gibbosus), protuberant, convex, hump-backed.

Gimnocefali (*γυμνός*, naked, *κεφαλή*, head), 145.

Ginglymus (*γίγγλυμος*, a joint), a kind of articulation admitting of only two motions, as in a hinge or the elbow-joint. In the legs of the Arthropoda, as a rule only flexion and extension of the joints are possible. Latreille, Le Règne Animal, p. 1, 1817, says of them, "Chaque article est tubuleux, et contient, dans son intérieur, les muscles de l'article suivant, qui se meut toujours par gynglyme, c'est-à-dire dans un seul sens."

Gland (glans, an acorn), "a cell or collection of cells, having the power of secreting or separating some peculiar substance from the blood or animal fluids." Anal-gland, 505; antennary gland, 372, 481, 506, 510, 549; cement-glands, 432, 496, 522, 1651; frontal-gland, 477, 478; hand or leg-glands, 432, 483, 489, 496, 518, 519, 1651; liver-glands, 525; oil-glands, 548; renal-glands, 504, 506, 549, 552; salivary-glands, 489, 538; sexual-glands, ovigerous and spermatic, 535.

Gliedfüssler. See Arthropoda, 544.

Gnathaptères (*γνάθος*, jaw, Aptera, wingless), **65**.

Gnathopoda (*γνάθος*, jaw, *πούς*, a foot), 289, 332, 362, 394, 487, 516; a term proposed by Milne-Edwards, and in 1856 adopted by Bate and Westwood for the appendages of the first and second segments of the peræon. Gerstaecker objects to the name because in numerous cases he can find no connection between these limbs and the taking up of food, while Claus retains it because in so many cases there is such a connection. The equivalents are—first and second pairs of anterior feet or legs, 81, 82, 84, 90, 100, 141, 179, 186; claws, 101; piedi-mani, 145, 150; Pedes thoracici primi et secundi paris, 211, 217, 284, 286; Manus or hands, 220; first and second pairs of feet, 286, 323, 326, 347, 351, 376, 397; Pedes trunci primi et secundi paris, 360; pattes thoraciques, 383, 417; quatrième et cinquième siagonopodes, 454; Handbeine, 427; first and second pereiopods, 516; second and third pairs of appendages, 563.

Gnathopoda, a name proposed by H. Woodward for the Entomostraca, "in allusion to the prevailing character in the Entomostraca, in which the head and *mouth-organs* are also mainly used in locomotion" (Encycl. Brit., art. Crustacea, 1878).

Gnathopoda, = Arthropoda, 478.

Gnathopodes, Straus-Durckheim, 134.

Greifhand, subchelate hand, 487, 537, 597.

Greifzange, chelate hand, 487.

Gymnobranches (*γυμνός*, naked, *βράγχια*, breathing-organs), "branchies extérieures, ou inconnues," the character, "branchies cachées ou inconnues," found in Risso's definition in 1816, was probably due to a slip of the pen, **96**.

Haltopoden (*ἅλλομα*, I leap, *πούς*, a foot), 1654. See Uropods.

Hanche, 93, 140, 155. See Basipodite.

Hand. See Propodite.

Heart, 184, 219, 280, 304, 338, 350, 364, 372, 383, 422, 471, 476, 480, 489, 505, 526, 549, 598.

Hedrioftalmos, 1632.

Hedriophthalma, 477.

Hedriophthalmata, 473.

Hepato-pancreas (*ἧπαρ*, the liver, *πάγκρεας*, the sweetbread), 525, 1636.

Heterobranchia (*ἕτερος*, other, *βράγχια*, breathing-organs), 131.

Heteropa (*ἑτερόπους*, with uneven feet, or *ἕτερος*, other, *πούς*, foot, with the feet varied), the definition given by Latreille does not well accord with the apparent meaning of the name, 125, **126**, 138.

Histology (*ἱστός*, a web or tissue, *λόγος*, discussion), "the science which treats of the minute structure of the tissues of plants, animals, etc.," 535.

Homology (*ὁμολογία*, agreement), conformity in the plan of organisation, correspondence in type of structure; thus the arm of a man is homologous with the foreleg of a horse, the maxillipeds of an Amphipod with its gnathopods, and its gnathopods with the second and third maxillipeds of a crayfish. Analogy, on the other hand, is correspondence not in type but in function, as the legs of an Amphipod and the legs of a horse are alike denominated legs from analogy, because of their application to similar purposes. 280, 289, 462, 473.

Hüfte, 485. See Basipodite.

Hüftglied, 365. See Coxopodite.

Hyperexapi (*ὑπέρ*, over, *ἕξ*, six, *πόδες*, feet), 125.

Hypodermis, **503**, 597, 1652.

Hypopharynx (*ὑπό*, under, *φάρυγξ*, the throat), the floor of the throat, between the mouth-opening and the œsophagus.

Hypostome (*ὑπό*, under, *στόμα*, the mouth), the ventral piece of the mouth, in which the two pairs of maxillæ are socketed, and which supplies a fulcrum to the labium. From its analogy to the os sphenoideum of vertebrates Schiødte (Naturh. Tidssk., ser. 3, Bd. iv. 1866) proposes to call it the sphenoid plate.

Imbricated (imbrex, a tile), said of plates overlapping one another in order like tiles on a roof. In the Amphipoda the segments of the body overlap from before backwards, and when the hinder edges are notably raised the structure is said to be imbricated.

Incubatory pouch, also called incubatory lamellæ, appendices flabelliformes, marsupial plates, marsupium, ovigerous lamellæ, oostegites, ovarial plates, scales (Schuppen). These plates are developed in the female of the Gammarina within the side-plates of the second, third, fourth, (and occasionally the fifth) segments, between the branchial vesicles and the body. They are generally fringed with long hairs. When needed for use they fold

in beneath the body forming a pouch in which the fertilised eggs and young attain their development. In the Caprellidæ they appear only on the third and fourth segments. Rudiments of them are said to be occasionally found in male Amphipods. 153, 185, 321, 418, 502, 522, 558, 1621.

Insecta, **62**, **65**, 92.

Integument, 290. See Cuticle, Epithelium.

Internal structure, 290, 315.

Intestine, that part of the alimentary canal which extends from the pyloric end of the stomach to the anus, 489, 504, 562, 598.

Intima, 489, 504.

Ionelles, so called from *Ione*, one of the genera included, 105.

Ischiopodite (*ἰσχίον*, the socket in which the thigh-joint, *μηρός*, turns, and *πούς*, a foot), the third (second free) joint of the leg; the equivalents are—second joint, third joint, knee, trochanter, second trochanter, Drehgelenk, Rollstück, genu, ischium, rotula, trochlea, tarsus, 140, 149, 155, 290, 485.

Isopoda (*ἴσος*, equal, *πούς*, a foot), "tous les pieds simples et uniquement propres à la locomotion ou à la préhension" (Latreille, Le Règne Animal, t. iii. p. 49), 99, 105, 122, 125, 155, 160, 169, 174, **184**, 215, **282**, 368.

Jambe, 93, 155. See Carpopodite.

Kaumagen, 482.

Kauplatten, 482.

Kieme, 365, 366. See Branchiæ.

Kleistagnatha (*κλείω*, I shut, *γνάθος*, a jaw), 64.

Kupferschiefer, marl-slate, in the Permian system; in certain parts of Germany this is charged with ores of copper, hence the German name, 148.

Labium (in Latin, a lip), a deeply bifid organ, attached centrally to the hypostome and forming the lower side of the mouth-opening; equivalent names are—lower lip, tongue, langue, languette, Paragnathen, Zunge, metastoma, Paragnatha, labium inferius; 93, 154, **449**, 486, 532.

Labium, applied by Fabricius to three of the mouth organs, 43, 56; la lèvre inférieure of Olivier is equivalent to the maxillipeds, the terminal joints of which are called palpi by Fabricius, 43, and antennules by Olivier, 57; Say uses the expression "labium (pedipalpi)" for these organs, 102, and Savigny the term lèvre auxiliaire, 93.

Labrum (in Latin, a lip), upper lip, lèvre supérieure, labium superius. "The labrum is divided into two parts, the lower of which moves on the upper by a slight hinge, and assists in perfecting the shutting of the mouth. The free margin is generally clothed with short hairs, often of club-shaped and deformed appearance" (Brit. Sess. Crust., vol. i. p. xiii.), 56, 154, 449, 450.

Læmodipoda (*λαιμός*, throat, *δίπους*, two-footed), "gorge à deux pattes."

Langue, languette. See Labium.

Lavalette'sche Kolbenorgane, 427, 429. See Calceolus.

Leg, joints of, 93, 140, 149, 155, 290, 360, 365, 485, 1654.

Leydig'sche Cylinder, 427, 429, 480.

Liver, **184**, 300, 304, 364, 487, 504, 598.

Lumbe. In Gmelin's Linnæus, t. i. p. 585, Martens' Lumbe (in the form Lumme) is given as a synonym of *Colymbus Troile*, Guillemot or Sea-hen, Foolish Guillemot, 7.

Magendarm, 482, 489.

Main, 155. See Propodite.

Malacostraca (*μαλακός*, soft, *ὄστρακον*, a shell), 1,2,4, **6**, 79, 83, **107**, 136, **1655**. See Crustata.

Mandibles, also called jaws, protognathes, Kiefer, Oberkiefer, 43, 56, 62, 71, 92, 107, 116, 117, **154**, 170, 184, **449**, **450**, **597**, 1653.

Mandibulata, 157, 254.

Marginate; "the term 'marginate' refers to a peculiar margin or thin cutting edge that is found on the palm in some species, the form and appearance of which are liable to variation" (Brit. Mus. Catal. Amph. Crust., p. 212).

Marksubstanz, 489, 567.

Marsupium, a pouch. See Incubatory pouch.

Matrix, 504, 597. See Hypodermis.

Maxilados, 231. See Maxillosa.

Maxillæ primi et secundi paris, also called first and second maxillæ, Mâchoires de la première et de la seconde paire, deutognathes and tritognathes, first and second siagonopoda, Unterkiefer and Unterlippe, innere Maxillen and äussere Maxillen; 57, 64, 92, 154, 217, 454, 532, **600**.

Maxillipeds, also called foot-jaws, maxillary feet, pattes-mâchoires, pieds-mâchoires, feuillets maxillaires extèrieurs, lèvre inférieure, tetartognathes, third siagonopoda, Unterkiefer, Unterkieferbeine, Kieferfüsse, Maxillarfüsse, Unterlippe, labium (pedipalpi), palpi, pedes maxillares; 57, 62, 64, 92, 144, 154, 185, 217, 226, 231, 256, 323, 360, 454, 488, 532, 552, 1654.

Maxillosa, Crustacés maxillés, Crustaceos maxilados, 125, 174, 231.

Medioliform (probably for modioliform, from Latin modiolus, the nave of a wheel), an epithet applied by Say to the second (in his terminology the third) joint of the second gnathopod of *Cerapus tubularis*, 100.

Meropodite (*μηρός*, thigh-joint, *πούς*, a foot), fourth (third free) joint of the leg; the equivalents are—third joint, fourth joint, bras, cuisse, Schenkel, Schienbein, Unterarm, metacarpus, tibia, meros; 93, 140, 155, 290, 485, 491.

Mesenteries (*μεσεντέριον*, an internal membrane), septa, membranes dividing the interior of the body into distinct cavities, of which one is called the dorsal or pericardiac sinus, another the ventral sinus, 489, 507.

Metacarpus. See Meropodite.

Metastoma. See Labium.

Metatarsus, used by Zenker for the fourth, fifth, and sixth (third, fourth, and fifth free) joints of the leg, 149; by Dybowsky for the fifth (fourth free) joint, by Claus and in the form metatarse by Milne-Edwards for the sixth (fifth free) joint, 155, 532.

Micropylic apparatus (*μικρός*, small, *πύλη*, a gate), 320, 350, 403, 553.

Millimètre, 0·03937 of an inch.

Mitosata, 63.

Moniliform (monile, a necklace), with numerous small joints like the links in a chain, 58.

Monodactyle (*μονός*, single, *δάκτυλος*, a finger), "hands without fangs," 69; used rather vaguely by the older authors, but generally implying a subchelate hand, as opposed to a chelate one, which they called didactyle, 19, 27, 45, 89, 100.

Mosaic vision, in which as in mosaic work the view of an object is obtained by the combination of many small pieces, this according to Johannes Müller being the mode of sight resulting from the structure of the compound eyes of the Arthropoda, 139, 483, 490, 495, 1635.

Muscles, 489, 503, 1636, 1647.

Muticus (ante-classical form of mutilus, curtailed, docked), a word used by the early writers apparently not in accordance with its meaning; Latreille, Hist. Nat., t. iv. p. 13 (An. X), thus describes the "pattes mutiques" in the Millepieds, "Leurs pattes sont composées d'articles diminuant insensiblement de grandeur, ce qui leur donne une forme conique; l'article qui les termine est d'une matière plus dure, cornée ou écailleuse, va en pointe plus ou moins arquée, et sert de crochet; mais on observe ici que ce crochet, par la diminution graduelle des articles de la patte, en est une suite, et que ce n'est pas un corps surajouté brusquement, de même que les petits ongles des tarses des autres insectes. On remarque une semblable configuration dans les tetracères et les crustacés, dont les pattes ne sont pas en nageoires." 23, 26, 29, 44, 51, 96, 126.

Myeloid substance (*μυελός*, marrow), 489, 567.

Myogène (*μῦς*, muscle), muscle-producing, 1647.

Nackendrüse, 504.

Nackenorgan, 477.

Natatorii pedes, appendices natatorii, natatory feet, i piedi natatori, 102, 116, 150, 154, 198, 286. See Pleopods.

Nektopoden (*νηκτός*, swimming, *πούς*, foot), 1654. See Pleopods.

Nervous system, 132, 153, 154, 304, 364, 504, 567, 597. See Brain, Commissure, Ganglion.

Neusteri (*νευστήρ*, a swimmer), 37. See Pleopods and Uropods.

Nidifica, nest-makers, 290, 307.

Normalia, 290, 360.

Nuclei of Semper, 490, 495, 597.

Œsophagus (*οἰσοφάγος*, the swallow or gullet), 154, 304, 321, 489.

Olfactory, cylinders, filaments, organs, setæ, organa cylindriformia, papilles olfactoires, Riechhaare, Riechzapfen, Spürfaden, 154, 304, 324, 349, 448, 457, 481, 510, 515, 548, 552, 597, 1648.

Olfactory denticle or tubercle (so-called), 290, 372, 481.

Oostegites (*ὠόν*, an egg, *στέγω*, I protect), 553. See Incubatory pouch.

Ostia, ostioles, of the heart, 489, 549. See Heart.

Otoliths (*οὖς*, *ὠτός*, an ear, *λίθος*, a stone), 405, 473, 553, 597.

Ovaries, 320, 471, 490.

Palma. "By *palma* (palm of the hand) we mean the part of the margin of the hand against which the finger closes" (Dana, U.S. Explor. Exped., vol. xiii. p. 855). Sometimes, however, the palm is defined by some process of the hand, which the finger either passes beyond or does not reach; Costa uses the expression "the unguicular palm."

Palpi, a term used by Scopoli for the upper antennæ, 24, 25; applied by Fabricius to various parts of the mouth-organs, 43, Olivier using the word antennules as an equivalent, 57; by Milne-Edwards the name palp was given to that part of the limb which he afterwards called the exopodite, 153, 154; in writings on the Amphipoda the term is usually and exclusively applied to what is presumably the endopodite of the mandibles, first maxillæ, and maxillipeds; Bate and Westwood, vol. i. p. xiv, observe "The mandibles are no exception to the fact that all appendages are but modified legs. In all Crustacea, we think that it can readily be demonstrated that the mandible consists of the first three joints being closely anchylosed. The small appendage, that generally consists of three freely articulated joints, represents the fourth, fifth, and sixth joints; the seventh, or dactylos, being seldom present. An homological examination of the genera *Nebalia* and *Pontia*, with *Homarus*, together with the homotypical parts in other appendages in the same animals, we think will readily confirm this opinion;" Milne-Edwards had earlier taken the same view, 154; Huxley, The Crayfish, p. 171, says of the mandible, "The endopodite is represented by the three-jointed palp;" Claus, Die Platysceliden, p. 9, appears to take a different view, for he says, "Spence Bate und Westwood betrachten merkwürdigweise den Kautheil der Mandibel bei den Amphipoden als aus drei verschmolzenen Gliedern hervorgegangen und führen den Taster auf das 4., 5. und 6. Glied der Extremität zurück, deren Dactylus selten erhalten sei. Es bedarf wohl keiner weiteren Ausführung, dass diese Ansicht eine willkürliche ist und durch keine Thatsache gestützt wird."

Paragnathen, Paragnatha, Paragnathi (*παρά*, beside, *γνάθος*, a jaw), 477, 488, 553. See Labium.

Parasites, 149, 317, 427, 490, 566, 579, 714, 1137, 1630.

Parasitic Amphipoda, 137, 392, 436, 464, 579, 1630.

Pata-quijadas, maxillipeds, 231.

Pedestria, 24.

Pedipalpi. See Maxillipeds.

Peduncle, in the Amphipoda applied to the basal portion of the antennæ, pleopods, and uropods.

Peræon, pereion ("from *περαιόω*, to walk about, pereion, part which supports the walking legs," Spence Bate, Brit. Assoc. Report, 1855, p. 27), normally consisting of seven segments to which the two pairs of gnathopods and five pairs of peræopods are attached; the equivalents are—body, thorax, truncus (*thorax* and *abdomen*), Mittelleib, Rumpf, Brust.

Peræopoda, pereiopoda, pedes ambulatorii, the five pairs of appendages that follow the gnathopods. The term is occasionally extended to include the gnathopods, and is then equivalent to—pattes thoraciques, Brustfüsse, Thoracalbeine, Fusspaaren.

Pericardium (*περί*, round, *καρδία*, the heart), 516, 526.

Pericerebral ring, 526.

Pericœsophageal collar, 526.

Perirenal ring, 526.

Permian, the geological system between the Carboniferous and the Triassic, 300.

Phosphorescentia, 75, 76, 87, 108, 123, 194, 275, 327.

Phylogenie, 537. See Genealogy.

Phytibranchia (*φυτόν*, a plant, *βράγχια*, breathing-organs), 99, 125, 138.

Piedi mascellari, pedes maxillares, palpi maxillares, applied erroneously to the lower antennæ, 145, 152, 239, 346, 347.

Piezognatha (*πιέζω*, I press, *γνάθος*, a jaw), **450**.
Pinnulæ pediformes, 58. See Pleopods and Uropods.
Plaxolia (? from *πλάξ*, anything flat and broad), 87, 88.
Plaxomia, 110. See Plaxolia.
Pleon ("from *πλέω*, navigo; pleon, part which supports the swimming legs," Spence Bate, Brit. Assoc. Report, 1855, p. 27), all that part of an Amphipod which is behind the peræon. Equivalents are—abdomen, post-abdomen, 467; Hinterleib, Schwanz, 181; Bovallius restricts the name to the first three segments of the original group, those namely which carry the pleopods, 558.
Pleopods, abdominal feet, swimming feet, fausses pattes natatoires, Nektopoden, Schwimmbeine, Schwimmfüsse, pedes spurii natatorii, pleopoda; sometimes applied to all the appendages of the pleon, but more usually restricted to the first three pairs, the three following being called uropoda, 182, 350, 372. They have also been called fausses pattes branchiales. 417.
Polygnates, 79.
Polygnathes (*πολύς*, many, *γνάθος*, jaw), 65.
Polygonata (perhaps from *πολύς*, many, and *γνάθος*, jaw), 64.
Polymeria (*πολύς*, many, *μέρος*, part), 149.
Procellaria glacialis, the Arctic Petrel, 116, 117.
Proctodæum, 478.
Propodite, the sixth (fifth free) joint of the leg. The equivalents are—hand, fifth joint, sixth joint, jambe, main, tarse, metatarse, Hand, Afterhand, Fuss-stück, manus, pseudomanus, tarsus, metatarsus, metacarpus, propodos, propodus, propus. 93, 104, 140, 155, 290, 532, 536.
Prothorax, the first of the three segments of the insect thorax, homologous with the segment which bears the maxillipeds in the Amphipoda.
Protognathes (*πρῶτος*, first, *γνάθος*, a jaw). See Mandibles.
Protopodite, the basal part of an appendage, comprising the coxopodite and basipodite, to the extremity of which the endopodite and exopodite are attached. See under Endopodite and Peduncle.
Pyloric (*πυλωρός*, a gate-keeper), applied to that end of the stomach which is connected with the intestine, 482.
Punktsubstanz, 489, 567.
Rectaldrüsen, 504.
Retinula, 495.
Retrally, ? from retro, behind, or a misprint for ventrally, 221.
Rhabdom (*ῥάβδος*, a rod), 495, 1638, 1652.
Riechzapfen. See Olfactory Organs.
Rostrum, rostral spine, Rüssel, the sometimes strongly produced centre of the head's frontal margin, 467, 497.
Ruderhaare, Ruderborsten, hairs or setæ of motive value, 477, 1245, 1254.
Salivary gland, 538.
Saltatorii pedes. See Uropods.
Schalendrüse, 481.
Schenkel, 485, 491, 1607. See Basipodite and Meropodite.
Schienbein. See Meropodite.
Schienenglieder, 485.
Schlundmagen (Schlund, throat, Magen, stomach), 489.
Schwanz. See Pleon.
Scuds, 435.
Seestengel, sea-stalk, 32.
Segment. See Annulus.
Semper'sche Kerne. See Nuclei of Semper.
Sensitive capsules, 457, 480.
Sessiliocles; Lamarck says, "J'ai donné le nom de *crustacés sessiliocles* aux animaux du second ordre, parcequ'ils ont les yeux fixes et sessiles," 66.
Sessilioclia, **88**.
Seta, sometimes used in Latin, and the earlier English, descriptions for the antennary flagellum, the antennæ with accessory flagellum being called *bisetæ;* the term has been also applied to the rami of the pleopods; but in later usage it is confined to the more or less hair-like processes of the cuticle, which are developed in various forms, and probably with very varied functions, in different parts of the body, 457, 480, 481, 504; Huxley, The Crayfish, pp. 197, 198, explains their nature and origin.
Sexes and sexual appendages, 284, 350, 364, 406, 408, 417, 457, 542, 548, 597.
Siagonopodes (*σιαγών*, the jawbone, *πούς*, a foot), 454. See Maxillæ, Maxillipeds, Gnathopods.
Sinnesborsten, sensitive setæ, 1254.
Sinus, abdominla, dorsal, pericardiac, ventral, 489, 506, 507, 526, 527.
Size of Amphipods, 198, 461, 467, 468, 497, 557.
Somiologie (*σῶμα*, body, *λόγος*, discussion), **87**.
Somite (*σῶμα*, body), 463, 655. See Annulus.
Somobiques (*σῶμα*, body, *βίος*, life), 88.
Spermatogenesis, 520, 563, 1638.
Stemmata, simple eyes, 92, 104, 154, 199, 306, 553, 1652. In *Ampelisca* the four eyes ordinarily observed are externally simple, but internally their structure is complicated; Della Valle speaks of a third pair of rudimentary eyes in some species, which may perhaps be properly described as Stemmata.
Stenotherm (*στενός*, narrow, *θέρμη*, heat), 421.
Sternum (*στέρνον*, the breast or chest), the ventral portion of a segment or somite.
Stomodæum, 478.
Strudelorgane, instruments for exciting a current or eddying of water, 477.
Stylets, abdominal, caudal, posterior. See Uropods.
Subchelate, subcheliferous, 80, subcheliform. "By a subchelate hand is meant one in which the finger folds upon the hand, but in which the inferior angle of the palm is not produced into an antagonistic thumb" (Brit. Sess. Crust., vol. i. p. 51). Complexly subchelate. "By this term I mean, whenever the chelate character depends upon other joints than the propodos" (Brit. Mus. Catal. Amph. Crust., p. 262).
Submoniliform, 101. See Moniliform.
Subulate, awl-shaped.
Sugeskaaler, suckers. See Calceolus.
Swimming, 167, 168, 274, 527, 578.
Syncerebrum, 567.
Synistata (*συνίστημι*, I unite), **40**, 62, 63.
Systole (*συστολή*, a contracting), 506.
Tactile bristles, 481, 504.
Tanaidæ, 201, 527, 544, **549**, 554, 587.
Tanaidea, 576, **579**.

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